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EDITORIAL



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We know of one general superintendent who receives each morning a group of wire reports detailing the overtime on the different parts of his grand division.

Day to Day Results

Somehow or other he seems to have secured a reputation for keeping his transportation costs down to rather satisfactory figures. We believe that the reason is not the result so much of the corrective measures he has to take as it is the result of the knowledge his subordinates have that their overtime figures are being carefully watched. The general manager of another road uses an interesting method of checking the use of power on his helper grades. He receives a daily report for each grade—he has a number and he has to bear in mind that helper engine service is expensive—showing the per cent of potential tonnage rating used on each train. The report is fairly complicated but the results shown are readily analyzed and their value amplified accordingly. Roads handling time freight service in large volume have as one of their greatest worries delays to cars set out of time freight trains because of hot boxes or mechanical defects. One railroad essayed to correct a situation wherein such delays were too lengthy by calling for a daily report showing the time at which the car was set out, the train on which it was later forwarded after proper repair, the time it was forwarded and the length of the delay. The figures on the report showed rapid improvement shortly after the report was instigated and for the reason that those who had such matters in charge realized that their performance was being checked and deviations from proper results would promptly be questioned. Every successful operating officer has his pet ideas of reports or statistics such as those here mentioned and there are few statistics used in railway operation that are put to more adequate use or can be said to permit more satisfactory results.

The practice of the British railways in building complete trains of special design instead of ordering many cars of uniform design has been commented upon

"Human Interest" Publicity

heretofore in these columns. Whatever the disadvantages of the practice—and from an operating standpoint there doubtless are many—there is at least one important advantage: The train has individuality which impresses itself upon all who use it. The result is highly valuable to the railway from a publicity and advertising standpoint. Nor do the British railways fail to take full advantage of the advertising potentialities of these trains. Each time a new one is built and placed in service, representatives of the press, of the learned professions and business are invited to ride it on its first trip as the guests of the railway. A recent example was the inaugural run of a new Pullman train on the London & North Eastern. The guest list included so many names of people of prominence in Britain that it must have looked to the average Briton much like the guest list for the trial trip of the S. S. Leviathan looked to the average American. When a train is given individuality, it is not much of an effort to add to it the

quality known to newspaper men as "human interest" and so highly prized by them that whatever has that quality will receive a great deal of space in their columns. The railroads must teach the public the elements of economics as applied to railroading and in doing so must make their appeal to the public's powers of reasoning—a rather difficult task at times. Appeals to sentiment, romance, human interest—call it what you will—are, however, quite as likely to be effective in making the railroads, particularly individual railroads, popular. In any event the full exploitation of whatever material of human interest there is to be found on a railroad will serve to fortify and strengthen public relations work dealing primarily with economics and statistics.

The Detroit, Toledo & Ironton is to be electrified, according to a recent item in the Ford News which is reprinted elsewhere in this issue. Railroad men in

Something New in Electrification

reading the item will observe some rather loose statements concerning the advantages of electric traction in general, but the article also states definitely what type of equipment will be used. The locomotives will develop a drawbar pull of 108,000 lb. at 25 miles an hour, have a one hour rating of 5,000 hp. and will weigh 360 tons. The voltage on the trolley will be 22,000. The article does not so state, but that of course means that the power supply current on the trolley will be alternating current. This voltage is twice that now in use on any line in this country. Its adoption does not present a problem which should cause any great difficulty, but it is unprecedented. Similarly it can be expected that the electrification will include many other features which have no precedent. Mr. Ford does not feel bound by the traditions of railroading and it is highly probable that he will use some of his unusual engineering talent in developing equipment which is radically different from anything now in regular operation.

The city or state officer who would most efficiently perform his duty as a conservator of safety on the streets and high-

Safety— on Railroads and on Highways

ways would do well, as regards many of the features of his work, to consult those of his railroad friends who have had experience in the supervision and discipline of locomotive runners; the division superintendent, for example. Safety in the streets depends very largely on the mental (and moral) attitude of thousands of persons of all ages who have license to drive automobiles. It is true that these people are not amenable to much discipline, and that the railroad officer's advice is not specially valuable (above that of other level-headed citizens) except because of his experience with drivers (of locomotives) who are subject to some discipline. Nevertheless, he can give the non-railroader numerous points. This note is not written with a view to suggesting that superin-

tendents should go out and offer their services as advisers, but it would not be out of place for such offers to be made, in some way—with all due modesty, of course. A railroad officer is bound to be a good citizen in as many ways as possible. The news item that started this paragraph was one telling of the action of a deputy police commissioner, Barron Collier, in New York City, in disciplining automobile drivers. In six months he had one thousand four hundred forty-one of them brought into court and convicted on charges of operating cars with defective brakes. Every railroad man can do a good work by making this fact known to municipal or other officers to whom it should be an incentive to go and do likewise. Mr. Collier also had 9,130 boys warned against stealing rides and hitching onto vehicles—a feature wherein he can perhaps give railroad officers a point. He has, however, 10,000 policemen at his command; a circumstance which, in the mind of the railroad officer, may excite feelings of envy, because of the high cost of police protection; but the fact is a significant one, nevertheless. Repressing lawless men and boys is a never-ending task and railroad officers and municipal authorities have a duty to co-operate with one another as fully as possible. Mr. Collier's right-hand man in his safety work is the well known specialist, Marcus A. Dow, formerly of the New York Central. Fatalities in the streets of New York have actually decreased a little during the half year, although the number of automobiles in use has increased by a total of 45,000 over 1922.

There is only one real test for railway statistics. That test is the use to which they are put and as a corollary the result effected by putting them to that use.

Statistics Meant for Use

A statement that there is only one test is admittedly a sweeping one, but it is, nevertheless, correct. Some people will maintain that there are other valuable tests besides that of use alone, such, for example, as timeliness, the adequacy of the information supplied by particular statistical units, etc. They will, of course, be correct in declaring that there are such other tests of statistical value but the fact will still hold true that the feature of use is the one of first importance. Take the element of timeliness. It is axiomatic that it is a leading essential in statistical compilation. It is an essential, however, only because the use of the statistics is facilitated by having that use follow as closely as conditions permit after the performance to which the statistics relate. It is, of course, important that the information supplied by the figures be adequate. The desirability of adequacy exists, however, to assure proper use. Proper use, naturally, cannot follow unless the conditions are known in their entirety. Otherwise the conclusions drawn from the figures may not be accurate and the remedy applied may not be the proper one for the situation. The compilation of records does, of course, not always imply the necessity of correction or remedy in the situations with which the records deal. The records may show a proper or improving situation. In such case that is their use, the corrective element in the use in this instance being only necessary when deviations from proper performance make themselves known in the periodic statements. All these details about the use of statistics are elementary but, unfortunately, elementary things have a way sometimes of being forgotten or slighted. The failure to bear in mind the adequacy of the test of statistics available in the single element of use is one of the basic reasons why we hear so much outcry about the statistical load with which railroad operation is burdened. Any organization could well afford to check up its statistics from time to time just to see whether its statistical reports are being used to the extent that their originators thought they

would be when the figures were first called for. We doubt not that as a result of such analyses reports here and there would go by the board or else be changed in compilation sufficiently to make them do the work that they were intended to do.

New England Railroad Report

IT IS TOO EARLY, at this writing, to tell how the report of the Joint New England Railroad Committee will be regarded in New England. It is too early, similarly, to determine what chance the recommendations made by the committee have of adoption. The report, whatever one may think of its recommendations, has, at least afforded to the public a means whereby everybody can secure an adequate idea of just how serious New England's railroad problem really is and it has offered some definite recommendations around which discussion of necessary remedies can center.

The committee favors a regional New England consolidation. Even those who disagree with it will concede that the committee has made a good case for this policy, and we are impressed particularly by the manner in which the report points out the advantages of having open gateways and alternate routes at the New England borders, and by its skill in introducing in the report excerpts from the testimony of the several trunk line executives who expressed themselves in the Interstate Commerce Commission consolidation hearings as not particularly favoring acquisition of the New England roads by their own companies. The study of the available water routes and of the differential rail routes via Canada is similarly worthy of attention.

The committee has offered a plan whereby it believes the New England roads can be made to stand on their own feet financially. In the case of the New Haven, attention is drawn to the road's failure to earn its fixed charges and to the burden of its remaining outside activities. The proposals made contemplate the scaling down of the New Haven's fixed charges through the issuance of preferred stock and the exchange of portions of the various bond issues for this new stock. A suggestion is made for no par value common stock and the sale—equivalent to an assessment—of about \$15,000,000 of the common to the present holders. The Government is to be asked to reduce the rate on the money owed to it by the New Haven from 6 per cent to 4 per cent. It is proposed that if the New Haven operates with a deficit the states of Massachusetts, Connecticut and Rhode Island shall make up the deficit by the remission of an amount equivalent to the state and local taxes paid by the road within the respective states. To safeguard the states' interest in such case it is proposed that a board of trustees—two from Connecticut, two from Massachusetts and one from Rhode Island—be appointed by the respective governors to take over the operation and management of the property. Boston & Maine capitalization it is not proposed to scale down because that was done in the recent reorganization, but a proposal is made for a similar remission of taxes and a board of seven trustees appointed by the governors of Massachusetts, New Hampshire, Vermont and Maine.

The proposal for possible operation by state-appointed boards of trustees may appear less extreme to New Englanders than to others, because the Boston Elevated Railway Company has been managed for a term of years by a board of trustees appointed by the governor of Massachusetts under a service-at-cost plan and a state and local guarantee of reasonable dividend rates. Even this precedent, however, does not constitute a very weighty argument in favor of operation by the states of the principal railway systems of New England. The advocates of the suggestion will natural-

ly be asked why it may be expected that the boards of trustees to be appointed under the committee's plan would be able to secure that desired improvement in the operations of the New Haven and Boston & Maine that the report contends the present managements have been unable to secure? No proof, or even suggestion, that the trustees would be able to secure improved operating results is contained in the pages of the report. To that extent the report is both incomplete and inconsistent, because it is the tenor of the report that improved efficiency of operation is the first necessity in New England transportation. The railroad experience of the world affords no evidence whatever that the management of railways by such boards would be successful.

The report is especially severe on the operating results secured by the New Haven and the Boston & Maine, and the severity seems all the greater because of the more favorable treatment accorded the New York Central-controlled Boston & Albany, the Maine Central, the Bangor & Aroostook, etc.

The criticism of the New Haven and the Boston & Maine is based largely on the ground that by delaying the placing of embargoes the managements have, in times of congestion, allowed too many cars to accumulate, with the result that car movement has been slowed down, the car miles and net ton-miles per car day reduced to abnormally low figures, the debit per diem charges raised out of reason, etc. Criticism is also made regarding high locomotive repair costs. Much is made of an interesting statistical unit—the percentage of cars moved of the total to be moved—and the contention is advanced that the figures for the two roads are unduly low. The suggestion is made that delays in yards are unduly excessive. An average of nine hours in yards is accepted as reasonable, and it is shown that, whereas at West Springfield on the Boston & Albany, the average car delay in the year ended June 30, 1922, was 6.1 hours; at Cedar Hill on the New Haven it was 13.2 hours; at Maybrook 13.4 hours; at Providence 14.8 hours and at Mechanicville on the Boston & Maine no less than 25.1 hours. Nothing appears in the way of suggestions for innovations to meet special New England conditions, and indeed there is very little about the special conditions which handicap peculiarly the operation of the New Haven and the Boston & Maine. Lack of space does not here permit discussion of the statistics and statistical methods used by the joint committee. The report, however, invites some interesting analysis of that kind, and we may expect the roads especially concerned to prepare and present it as soon as they have had an adequate opportunity to study the findings in detail.

The larger share of the criticism of New England's railway transportation is directed at the efficiency of operation. It is significant that in the case of the New Haven there is not recognized any great need of increased facilities. The committee has failed to notice the anomaly in a situation whereby the New Haven is conceded to be adequately provided with trackage, terminals, heavy motive power, etc., and is, nevertheless, held unable to produce what the committee's experts and the New England shippers regard as satisfactory operating results.

The explanation apparently is to be found in a lack of that most important factor of successful railway operation, a proper morale. It is the opinion of many observers that the two large New England carriers are suffering severely from lack of a proper attitude on the part of their own employees, and on the part of the shippers and public along their lines. This being the case it follows that corrective measures must be taken in the form of adequate personnel and public relations activity of a sort that will bring about greater co-operation on all sides.

The report pays deserved tribute to the executives of the New England lines, and especially the presidents of the two largest railways, who "taking charge of their respective offices when many adverse factors, and especially financial difficul-

ties, had developed, have carried their burdens * * * with untiring devotion and great courage." Whatever may be the situation on the Boston & Maine and the New Haven, Presidents Hustis and Pearson did not create it. It is a heritage from a former regime. They have done their best in the circumstances to remedy it; and, as the committee very well says, theirs "has been a lonely struggle against great odds" and "it is time the people of New England appeared on the scene to lend their aid."

Whatever one may think about the remedies proposed by the committee for the financial rehabilitation of the New Haven and Boston & Maine, or about the adequacy of its accomplishments as formulated in the report, it must be admitted that the committee has made a start in the right direction. Its plan is revolutionary but if New England is to live, industrially, it needs—and the report leaves no question about it—a revolution in its railway transportation service. If there is one thing that the report demonstrates beyond question it is that New England industry is very much worried about what will happen to its development if its railway transportation is not speedily remedied and improved.

When all is said and done, the report refuses to admit that New England is decadent industrially; it refuses to admit that the New England roads are confronted with insuperable obstacles. It asserts that New England is not securing the adequate transportation service which is its first industrial essential. Whether the recommendations may be adopted or not—we cannot believe that at best more than a portion of them will be—we must all hope that at least they prove sufficiently fruitful of discussion so that something will come out of it which will start the New England railroads on a more useful and profitable career than that which they have followed in the recent past.

Reduction in Loss and Damage of Freight

ONE OF THE MOST strikingly successful campaigns of any kind for increased efficiency ever carried on by the railways has been the campaign they have been waging, and are still waging, to reduce loss and damage of freight and the resulting claims that must be paid. During the war, and especially when the railways were being operated by the Government, loss and damage of freight and payments for them increased very abnormally. The total payments for loss and damage of freight made in 1917 amounted to \$35,000,000. In 1918 they increased to almost \$56,000,000; in 1919 to almost \$105,000,000; and in 1920 to more than \$119,800,000. The increase in 1920 over 1917 was more than 240 per cent.

This increase in loss and damage of freight and in the claims paid were due principally to two causes. One of these was the great increase of prices which made all commodities shipped more valuable and, therefore, rendered it necessary for the railways to pay larger amounts in settlement when goods were destroyed. The second cause was a decline in the morale of railway employees and deterioration of the condition of equipment. The former cause was beyond the control of the railways, but the latter was not. Soon after the roads were returned to private operation they jointly, through the American Railway Association, engaged in a nationwide campaign to reduce loss and damage. This campaign has been carried on chiefly through the Freight Claim Division of the Association. The causes of loss and damage of freight have been carefully studied. The co-operation of shippers in the interest of better packing and marking of freight has been secured and great efforts have been made to

reduce the rough handling of cars and goods. In 1921 the total payments for loss and damage were reduced to \$92,500,000; and in 1922 they were reduced to \$44,500,000.

Of course, these reductions in total payments were largely due to the decline of commodity prices and also to the decline in the amount of freight business handled. But these are not by any means sufficient to account for a reduction of \$75,300,000 between 1920 and 1922, or about 63 per cent. Furthermore, even since the big increase of freight business within the last year loss and damage payments have continued to decline. In the first three months of 1921 they amounted to \$29,300,000; in the first three months of 1922 to \$14,850,000; and in the first three months of 1923 to only \$10,950,000. The reduction in the first three months of this year as compared with the same months of 1921 was 63 per cent, and as compared with the same months of 1922 it was 26 per cent.

Every class of shippers suffers by loss and damage of freight and is benefited by their reduction. Because of their perishable nature loss and damage payments on fresh fruits and vegetables are relatively the largest and constituted, in the first three months of this year, about 16½ per cent of the total payments paid. About 6 per cent of the claims paid were for loss and damage of grain, about 6 per cent for loss and damage of livestock, and almost 7 per cent for loss and damage of coal and coke. The causes of loss and damage are numerous.

For example, in the first three months of the present year the railways had to pay claims amounting to \$1,960,000 resulting from damage caused by the rough handling of cars. They had to pay \$873,000 because of claims resulting from robberies.

The ratio of the total freight claims paid to the total freight earnings in 1919 was 2.95 per cent; in 1920 it was 2.78 per cent; in 1921, 2.36 per cent; and in 1922, only 1.12 per cent, which probably is relatively the best record ever made in any year.

Utilizing Idle Multiple Main Tracks

THE RAILWAYS will soon be confronted with the seasonal problem of handling a peak load traffic incident to the movement of the grain crop and with all indications pointing to the fact that this traffic will far exceed that of any previous year. It is evident that this traffic will tax the capacity of the railways to the fullest extent and will require the maximum utilization of all track and other facilities if undue congestion and delay are to be prevented. One method which will contribute to the reduction of this delay and congestion is to use those stretches of second track which may be idle at intervals for the movement of trains contrary to the direction of traffic and thereby relieve the congestion on the other tracks.

The running of trains against the current of traffic on multiple track lines as a regular procedure has not been practiced to the extent that its advantages entitle it to, no doubt largely because of the hesitation of many managements to take this step through a feeling that it may introduce additional hazards. That this method of operation is safe and practical under proper restrictions is proved by the experience of those roads which have followed it for years. The results which have been secured by the adoption of this practice on the Big Four are outlined in an article which was published on page 9 of the *Railway Age* of July 7. In that article it was emphasized that it has been the common practice on this road to run trains against the current of traffic on one or more divisions for 22 years, during which time

but one serious accident occurred which may in any way be charged to this method of operation.

In the desire of the railways to maintain an uninterrupted flow of traffic and to prevent congestion when laboring under the peak load, it would seem logical that they should use those stretches of second track which are now allowed to lie idle at times to move the traffic which is being delayed on the other track. Particularly at such times an idle track is an economic loss. Railway officers may well give this method of operation serious consideration at the present time, not only from the standpoint of meeting an emergency of heavy traffic, but as a general expedient for use throughout the year.

New Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books

Motion Pictures in Education, by Don Carlos Ellis and Laura Thornborough. A handbook of the development of visual education, and where and how to obtain films at present available for educational purposes. 300 p. Published by Crowell, New York.

Wall Street Fifty Years After Erie; Being a Comparative Account of the Making and Breaking of the Jay Gould Railroad Fortune, by Ernest Howard. With author's suggestions as to 1923 railroad policy. 181 p. Published by the Stratford Co., Boston.

Periodical Articles

The American Railroads and Private Ownership. International Interpreter, July 14, 1923, p. 451-452.

Business Must Take an Interest in Consolidation of Railroads, by Charles J. Fagg. Shipper & Carrier, July, 1923, p. 226-227.

The Farmer-Labor Fiasco at Chicago, by Robert Morss Lovett. Who constituted the convention and the various conflicting aims of the participants. New Republic, July 18, 1923, p. 198-200.

Give Our Railroads a Chance, by F. E. Scott. Shipper & Carrier, July, 1923, p. 225-226.

Railway Grouping in England, by Sir William M. Acworth. How the American problems of consolidation compare with those faced by Great Britain. Harvard Business Review, July, 1923, p. 414-416.

Railway Transportation in Hungary in 1922, by Edwin C. Kemp. Progress in recovery from effects of war and disorganization. Commerce Reports, July 16, 1923, p. 185-186.

The Relationship of the Burlington-Great Northern-Northern Pacific Group to the Federal Railroad Consolidation Law, by Walker D. Hines. Harvard Business Review, July, 1923, p. 398-413, with map insert opp. p. 398.

The Renaissance of American Railroads. III. Valuation and rates discussed. International Interpreter, July 14, 1923, p. 469-471.

A Revolution in Railway Fares, by Herbert Birch. Proposition that payment of passenger fares be made by speed. English Review, July, 1923, p. 82-87.

The Role of Economic Profits in the Return on Investments, by Arthur Stone Dewing. Footnote on page 460 gives results of study of railroad bonds 1892-1922, purchased by two established Boston banks. Harvard Business Review, July, 1923, p. 451-463.

Big Four Tests I. E. C. Train Control Device

Apparatus Tried Out in Freight Train Service to Demonstrate Effect on Tonnage Trains

TESTS OF AN AUTOMATIC TRAIN DEVICE which has been developed by the Indiana Equipment Corporation, Indianapolis, Ind., were made on the St. Louis division of the Cleveland, Cincinnati, Chicago & St. Louis at Avon, Ind., approximately 10 miles west of Indianapolis, on July 2 and on July 10. These tests were made on a descending grade of $12\frac{1}{2}$ ft. per mile. A Mikado type locomotive



The Construction of the Speed Controller

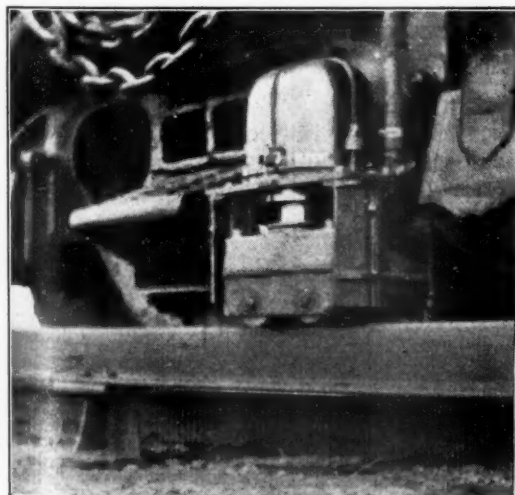
was equipped with the apparatus and the roadside elements were located at two signal locations on the east-bound main track east of Avon. Eight test runs were made on July 2 and five tests were conducted on July 10.

The principal parts of the locomotive equipment are the shoe housing and shoe, the automatic brake valve, the con-

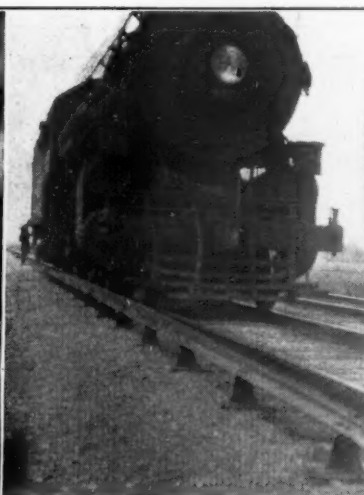
the ramp before the front roller makes contact. The stem, supporting the roller housing, is equipped with heavy buffer springs, both front and back, to equalize the shock around the stem. The upper part of the stem is surrounded by a heavy hub bearing with a bolt passing through the bearing and the slotted stem. The stem is of steel tubing and is supplied with a spring buffer to act as a cushion for the housing. The upper part of the stem supplies movement to two circuit breakers. Two safety rods are used in supporting the shoe, and they are so arranged that if they should break, they will allow the shoe to drop about $\frac{3}{4}$ in. which will cause a service application of the brakes on the train. The shoe and the stem have been designed so that their weight insures the return of the shoe to its normal position after leaving the ramp. The shoe is contained in and supported by a built-up housing of a boiler plate steel angle and cast steel end guides, and is located on the rear truck of the engine tender.

Operation of Brake System

The automatic brake valve is of the slide valve type, following standard air brake construction. It accomplishes the required gradual brake pipe reduction according to the speed of the train under the dual control of the speed governor and the electro-pneumatic valve, and is provided with a differential valve to insure a brake application regardless of low brake pipe pressure. In action, this valve makes a gradual reduction of the brake pipe air pressure in order to prevent quick action of the brakes on the front of the train, and follows this with a gradual stoppage of the brake pipe exhaust, in freight service; in passenger service, it is adjustable for high speed quick action braking. The valve is constructed to co-ordinate with full efficiency of the E.T.



Shoe Engaging Ramp



Engine Approaching Ramp



Location of Speed Controller

trol relay, and the speed controller. The shoe consists of a malleable casting supporting two large steel rollers, so arranged that three contact points ride on the ramp rail. These contacts were designed with a view to insuring electrical contact with the ramp. Before the front roller makes contact the rear roller is slightly lower in the housing than the front roller, thus permitting it to make contact with

brake equipment, and an automatic service application of the brakes approximates proper hand operation by the engineer of the engineer's brake valve. The valve makes a required brake pipe reduction and laps the valve to hold the brake on the engine and on the train. The automatic valve does not prevent the engineer from operating his regular brake equipment, or interfere with hand braking. However, if the

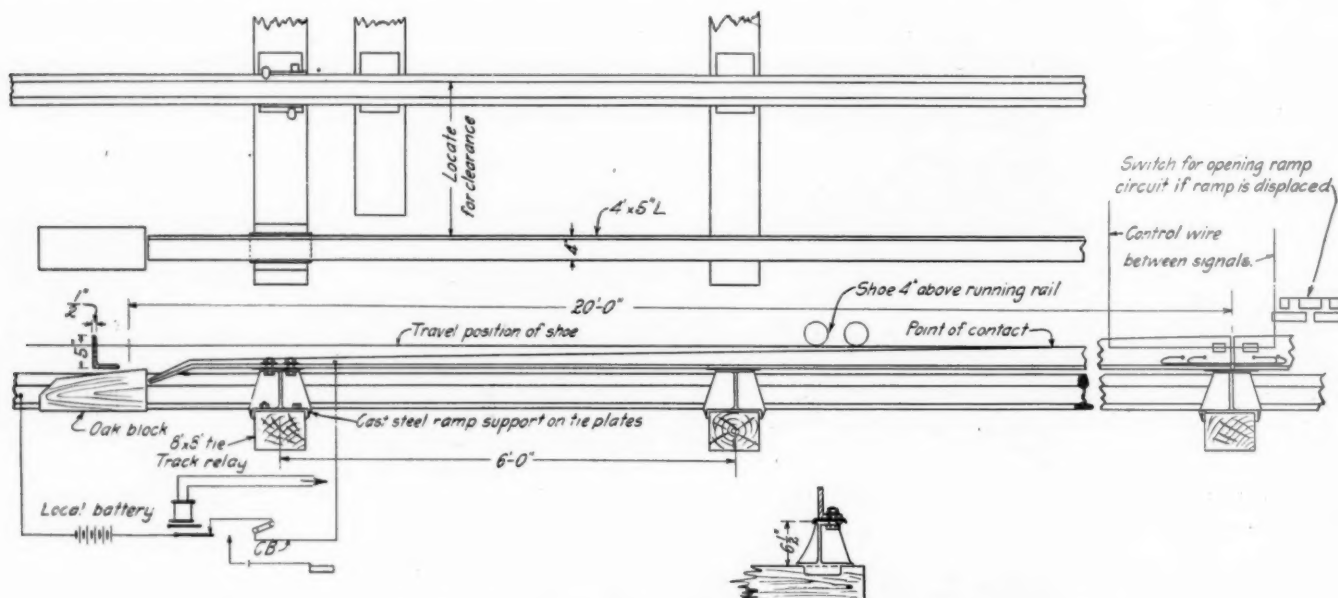
engineman should make a light brake pipe reduction, the automatic brake valve will complete the operation, subject to the action of the speed controller. The engineman can hold the brakes on the engine and recharge his train without interference from the automatic valve. If the engineman operates the release switch, which is provided for that purpose, an automatic release of the brakes and the recharging of the train braking system will take place when the train speed has been reduced to the predetermined safe speed limit. A train traveling at any speed, on entering a caution or stop block, will receive a full service application of the brakes unless the engineman operates the control switch in the cab. The operation of this switch will set up the speed control to govern the brake application, bringing the engine and train down to the predetermined permissive proceed speed, and it will prevent a brake application if the train is already traveling within the low speed limit. Should the engineman fail to operate this switch, the train will come to a full stop. When two or more engines are coupled together the brake control is cut out of service on all engines except the first one

tion. The controlling arms are located on the back plate, allowing no overhang and are arranged at right angles to the axle. The speed control circuit is so arranged in the system that if the speed controller should be destroyed, a service application of the brakes will result. Under such a condition the engineman can break a seal in a special conduit provided and place fuse plugs, thus cutting out the speed control apparatus in the system, and the train can then proceed under the protection of the simple automatic train stop.

Signals consisting of a yellow and a green light are located in the cab. A yellow light indicates an automatic application of brakes, while a green light indicates clear or high speed. A combination of the yellow and the green lights burning at the same time indicates a permissive proceed movement.

The Ramp

An 80 ft. ramp, located at the proper distance from the gage of the rail to insure clearance, and placed parallel to



Two Views of the Construction of the Ramp, With the Circuit for the Ramp Feed

by means of closing the brake pipe double-heading valve in the brake system.

The Speed Control Mechanism

The speed control mechanism is of the centrifugal type, bolted on the end of the journal outside of a pony truck wheel, and operates as required to cause a service application of the brakes if a predetermined safe speed should be exceeded in traveling through a caution block or in restricted speed territory, around curves, or through crossovers or the approach thereto. The speed control has a manual control feature in connection with it, requiring the engineman to operate a switch manually to permit the train to pass a caution or a stop signal without a brake application, provided he is traveling within the predetermined safe speed limit allowable for passing caution and stop signals. A graduated service application of the brakes through the medium of the speed control is arranged in such a manner that a quick service application takes place for high speed and a more moderate application is provided for at lower speeds. For freight service, a limited high speed adjustment of 40 to 45 miles per hr. can be made on the speed controller if desired, which will govern and prevent excessive speed.

The speed controller is of heavy malleable iron construc-

tion. The ramp is connected electrically through the track relay and the signal control circuit so that the removal of the ramp, or breakage in the ramp circuit, will cause the roadside signal to indicate stop and also will give a "stop" indication on the ramp one block in advance. The location of the ramp will be governed by traffic and train braking conditions.

The ramp is made of 4-in. by 5-in. L's, and is in four parts. There are two 20-ft. leads and two 20-ft. intermediate sections. The top of the ramp is planed, and the two end pieces are on a taper of 3/16 in. in 12 in. The ramp is held in place by cast steel ramp supports located at intervals of 6 ft. which are bolted to 8-in. by 8-in. sawed ties of the proper length to provide clearance for the ramp. Standard interlocking tie plates are used to tie the ramp in solidly to the track and to hold it in proper gage relation to the rail. The ramp is insulated from its supports by 3/16-in. fiber insulation. Each end of the ramp is turned down and protected by a tapered oak block to prevent dragging equipment from causing damage.

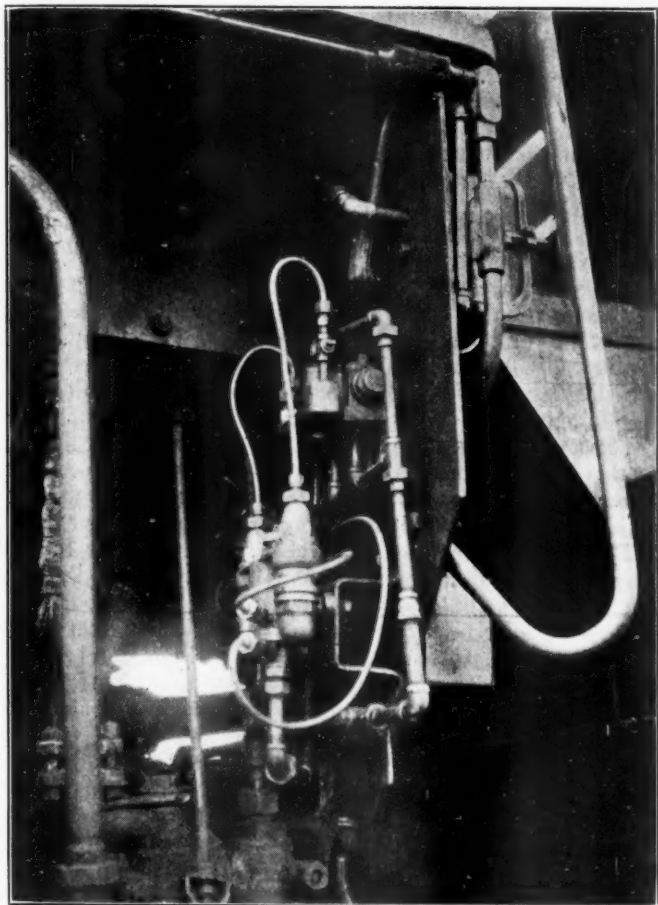
The engine circuits operate on the closed circuit principle, and contain a specially constructed heavy electrically operated circuit controller for both clear and unclear circuits. The opening of any closed circuit will result in a service

application of the brakes. The electrical controller and a 10-volt storage battery is suspended in a box under the engine tank.

Tests Made

The train used in the tests on July 2 was a local freight from Terre Haute, Ind. to Indianapolis, consisting of 22 loaded cars, 1,340 tons, and a Mikado type locomotive (Wt. 246,000 lb. on drivers. Cylinders 27 by 30) equipped with I. E. C. Train Control System and Westinghouse E. T. brake equipment. The air was cut out on two cars, leaving 20 cars with effective brakes. The train was stopped at Avon station, and the I. E. C. system was cut into service. The tests were made under the supervision of C. F. Stoltz, signal engineer, and C. B. Miles, air brake supervisor of the Big Four.

The first test was made with the train running at a rate of



Top Valve, Control Valve; Bottom Valve, Graduating Brake Valve for Split Application of Air

35 mi. an hr. at the time the shoe passed over the ramp. The ramp was energized to set up a clear indication and the engine proceeded at speed.

The second test was made at the next ramp location, the ramp being de-energized for the approach to a signal in the "stop" position. The speed on passing over the ramp was 35 mi. an hr. and an automatic brake application was received. The brakes were released by the engineman pushing his control switch after which the train was brought to a stop by the engineman operating the brakes manually.

The third test consisted in backing the train up over a de-energized ramp at about 10 mi. an hr. An automatic brake application was received which stopped the train in about 300 ft. The automatic train control apparatus was effective with the throttle open and a smooth stop resulted.

Test No. 4 was made by backing the train over the next

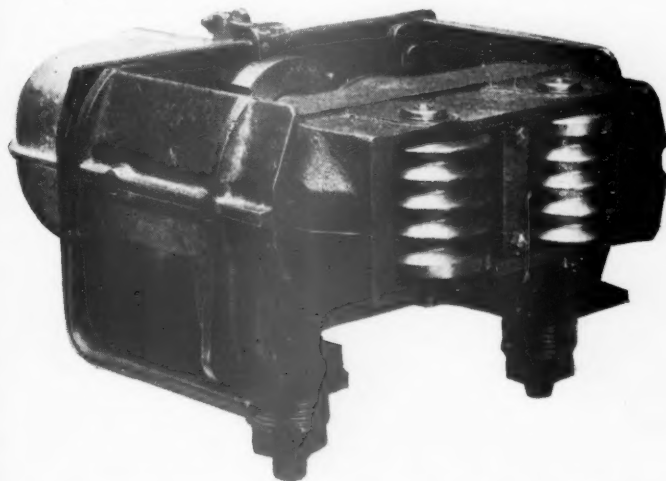
ramp which was also de-energized, the engineman operating his release switch, thus allowing the train to continue backing up under the low speed limit.

Test No. 5 was made with the train proceeding forward at a rate of 35 mi. an hr. at the time of passing over the ramp. As the ramp was de-energized, the automatic train control apparatus functioned giving a brake pipe reduction of 15 lb. in 11 sec. The train was brought to a stop in 2,900 ft. in 1 min. and 33 sec. The throttle was open until the train stopped. A smooth stop was made and there was no jar to the equipment.

The above five tests were made with the brakes on the train effective only; as the engine brakes were held off.

Test No. 6 was made by the train passing over a de-energized ramp at a rate of 35 mi. an hr. The automatic control apparatus caused a 15 lb. reduction, bringing the train to a stop in 1 min. and 10 sec. in a distance 1,980 ft. The train was brought to a stop in a shorter distance in this test because the engine brakes were also applied by the apparatus.

Test No. 7 consisted of the train passing a de-energized ramp at 25 mi. an hr. The train was stopped in a distance



Shoe Showing Construction and Location of Contact Rollers

of 1,700 ft. in 1 min. and 2 sec. The engine brakes were also applied by the train control apparatus in this test.

Test No 8 consisted of a series of tests on the operation of the speed control as the train proceeded towards Indianapolis. In these tests the train was accelerated until the critical speed was exceeded when the speed control apparatus became effective, applying the brakes and reducing the speed of the train to the proper rate. When the train had reached a speed a little below the critical speed, it was again accelerated to a point where the speed control apparatus applied the brakes.

A number of these tests were made, the speed control in each instance functioning property. All of the stops were smooth and easy, with no jar or damage to equipment.

On July 10, a second test of the I. E. C. equipment was made on a 100-car freight train under the direction of Mr. Miles and C. C. French, assistant signal engineer. This train was not made up specially for the tests, but contained the regular run of cars. At Avon, the I. E. C. system was cut into service. Tests were made as the train proceeded to Indianapolis under ordinary running conditions. The train consisted of engines 6177 (equipped with the train control apparatus) and 6186, hauling 100 cars and the caboose, of which 77 were loads, and 23 empties, weighing 4,284 actual tons. The brakes were cut out on three cars on the train. The engines are equipped with an 8½-in. cross compound compressor and ET equipment with a U pipe connecting the application cylinder to the distributing valve release pipe,

which prevented the application of the locomotive brakes with the brake valve in running position.

The first test was a standing test to ascertain the amount of brake pipe leakage, and the time necessary to apply the brakes on the rear cars under full manual operation of the automatic brake valve, and by the use of the train control. The time required to apply the brakes manually on the rear of the train with a 15-lb. reduction was 1 min. and 30 sec. (in the release tests the time required to release the brakes was lost).

Test No. 2 consisted of passing the first ramp at a speed of 35 mi. an hr. with the ramp energized and with a clear single indication.

Test No. 3 was made by the train passing the second ramp which was de-energized and the brakes were applied by the automatic train control apparatus giving an 8 lb. reduction. There were no brakes set on the engines, and both engines used steam up to the time they were stopped. The train was stopped in a distance of 7,920 ft. in 3 min. and 45 sec. The speed on passing the ramp was 35 mi. per hr. A smooth stop resulted. Test No. 4 was a standing test to determine the brake pipe leakage. This test showed that there was a loss of 7 lb. per minute from 50 lb. The time required to apply the brakes on the rear of the train with a 20 lb. reduction was 55 sec., while the time required to release the brakes on the rear was 2 min. and 40 sec. At this time it was decided that a heavier brake pipe reduction was necessary and the I. E. C. valve was adjusted for a 20 lb. reduction.

Test No. 5 consisted of operating a switch located in the cab so arranged that an equivalent action would be produced on the train control apparatus as if it were operated over a ramp in a de-energized condition. At the time of this test the train was proceeding at approximately 35 mi. an hr. and on the operation of the switch a 20 lb. reduction was made automatically which brought the train to a stop in a distance of 6,600 ft. in 1 min. and 57 sec. In this case, the engine throttles were eased off slightly and a smooth stop resulted. The observers on the caboose stated that all the stops made were found to be smooth at the rear end of the train.

Three Major Wage Disputes Before Labor Board

REQUESTS for increases in wages by three labor organizations involving a number of roads operating in all parts of the country are now on the docket of the Labor Board for immediate adjudication. Hearings on one case which involves the signal department employees on nine roads represented by the Brotherhood of Railroad Signalmen began on July 19. The rates which are sought are \$1 an hour for gang foremen; 90 cents an hour for leading signalmen and leading signal maintainers; 85 cents an hour for signalmen and signal maintainers; 62 cents an hour for the first six months of service of assistant signalmen and assistant signal maintainers, with a two-cent increase after each six months of the first four years of service, and 60 cents an hour for helpers. Among the roads involved in the hearing are the Atlantic Coast Line, the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Chicago & Western Indiana, the Grand Trunk system in the United States, the Louisville & Nashville, the Western Pacific, the C. M. & St. P. and the S. P. lines in Louisiana and Texas.

On July 23 the Labor Board will consider the request of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees for increases in wages to restore the rates in effect under the provisions of decision No. 2, which was effective May 1, 1920. On some of the roads involved in this case, which were not affected by

the new working rules ordered under decision No. 1621, the rules adopted by that decision, including time and a half after eight hours and for Sundays and certain specified holidays, are requested. The defendant roads in this case are the Atchison, Topeka & Santa Fe, the Atlantic Coast Line, the Boston & Maine, the Chicago & North Western, the Chicago & Western Indiana, the Chicago, Indianapolis & Louisville, the Chicago, Milwaukee & St. Paul, the Chicago, St. Paul, Minneapolis & Omaha, the Denver & Rio Grande Western, the Duluth, South Shore & Atlantic, the Great Northern, the Illinois Central, the Kansas City Southern, the Joplin Union Depot, the Kansas City Terminal, the New York, Chicago & St. Louis, the St. Paul Union Depot, the Seaboard Air Line, the Southern Pacific, Pacific System, the Southern System, the Union Pacific System and the Western Pacific. Restoration of the rates prescribed by decision No. 2 would result in increases from 8 to 14 cents an hour for the various classes of clerical and station employees.

The request for increased wages presented by the Order of Railroad Telegraphers will be considered by the board on July 27. Among the roads involved in this case are the Atchison, Topeka & Santa Fe, the Nashville, Chattanooga & St. Louis, the Atlantic Coast Line, the Boston & Maine, the Chicago & Western Indiana, the Chicago, Milwaukee & St. Paul, the Gulf Coast Line, the Kansas City Southern and the Midland Valley. Additional petitions involving other roads are expected by the board before the opening of the hearing. The requests by the telegraphers are, in general, for increases in rates of pay and revisions of rules governing working conditions. However, they are by no means uniform on the individual roads. In the matter of rates, various increases are proposed, the requests apparently being designed to eliminate local inequalities and to equalize with adjacent roads having higher rates of pay. In the matter of rules, the request is more general on all roads with respect to overtime, Sunday and holiday work, calls, intermittent service and vacations, but some revisions in local rules are requested.

Following the remanding of the wage dispute between the Brotherhood of Maintenance of Way Employees and Railway Shop Laborers and a number of the roads, some individual settlements have been negotiated. The Chicago Great Western has granted increases as follows: Bridge and building foremen and their assistants, \$6.84 a month; section foremen, \$6.84 a month; assistant section foremen, 2½ cents an hour; mechanics, 2 cents an hour; mechanics' helpers, 1 cent an hour; track laborers, 1 cent an hour; bridge tenders and watchmen, 1 cent an hour. Some 2,900 employees are involved, the aggregate annual increase being \$100,000. The Spokane, Portland & Seattle has approved the following increases to its maintenance of way employees: Bridge and building foremen and their assistants, \$10 a month; section foremen and their assistants, \$5.84 to \$8.84 a month; mechanics, ¾ cents an hour; mechanics' helpers, 2 cents an hour; track laborers, 2 to 3 cents an hour; drawbridge tenders and watchmen, 3 cents an hour; pumpers, cranesmen and firemen, \$6.12 a month.

The Central of New Jersey has granted increases to 4,000 of its shop crafts employees amounting to \$392,000 annually. Mechanics, helpers, helpers' apprentices, apprentices, car cleaners and common laborers were given a wage advance of 3 cents an hour, and stationary engineers received an increase of 2 cents an hour. Mechanics and helpers in the maintenance of way department of the Delaware, Lackawanna & Western have been granted an increase of 2 cents an hour, while apprentices on the same road received an increase of 1 cent an hour. Coach cleaners employed by this road were granted an advance of 4 cents an hour. In a settlement by the Pittsburgh & Lake Erie with the clerical employees on its line represented by the Brotherhood of Railway and Steamship Clerks, increased wage rates from 1 to 3 cents an hour have been approved.

Civil Engineers Discuss Transportation Problems

Program of Annual Convention at Chicago Devoted to Various Phases of Railway Service

THE AMERICAN SOCIETY OF CIVIL ENGINEERS presented a transportation program at its fifty-third annual convention which was held at Chicago on July 11-13. More than 650 members and guests registered including a large number of railway men who were attracted by the nature of the program. The sessions were presided over by C. F. Loweth (chief engineer, C. M. & St. P.), president of the society, while the arrangements for the convention were in the hands of H. R. Safford (vice-president, C. B. & Q.), chairman of the local Illinois section of the society. The session on Wednesday was devoted to the consideration of the broader phases of the transportation problem and several papers were presented which are given at length below.

On Thursday the program dealt largely with local problems, particularly at Chicago. On Wednesday afternoon

inspection trips were made to points of engineering interest, including the Chicago Union Station, and the Structural Materials Research Laboratory of the Portland Cement Association, while on Thursday afternoon a large number visited the rail mills of the Inland Steel Company at Indiana Harbor, Ind., and the plant of the Universal Portland Cement Company at Buffington, Ind.

In calling the convention to order on Wednesday morning Mr. Loweth traced the history of the society at length and described its growth up to the present time. He referred to the problems confronting the society in its readjustment to meet the new conditions now arising and described the measures which are being taken to solve them. He then referred to the influence which the society has exerted in many channels and the aid which it has rendered the railways and other industries in the solution of their technical problems.

Some Phases of Present Day Railroad Transportation

By J. W. Kendrick

Chairman of Board, International-Great Northern Railway

In the past we have made the mistake of being more concerned about the cheapness of transportation than about the ability of the railroads to handle promptly all the traffic offered. As a result of the constant pressure for lower rates, railway expansion was arrested at a time when there was a tremendous increase in the capacity for production. Recurrent transportation shortages during the last several years have served to prove that we are following a shortsighted policy. Good transportation is cheap at any price fairly commensurate with the cost of its performance.

It is well known that for many years practically all railway financing has been accomplished through borrowings, as investors have been reluctant to purchase the stocks of any but the strongest companies and thus assume the greater risk of partnership in the business. Railway capitalization has, therefore, become top heavy with debt at the expense of the security of railway stocks. What is needed is the bringing of new partners into the business of the financing of railway expansion and improvement through the sale of stock issues.

One of the best measures of the prosperity of a railroad or any other business is the number of cents out of each dollar earned by it that is paid out for earning it, that is, for operating expenses. If you apply this measure to the results of railroad operation in this country before and since the effective and drastic regulation of rates was adopted it discloses certain significant facts. During the earlier period of less rigid regulation, say from 1890 to 1910, there was only one year, namely 1908, which was a year of depression, when the ratio of operating expenses to operating revenues of the railways exceeded 70 per cent. On the other hand, there never has been a year since 1911, when the Interstate Commerce Commission rendered its decision denying the railways the first general advance in rates for which they asked, that the ratio of the expenses of railways to their earnings has not exceeded 70 per cent, and in some years 80 per cent. It is also a notable fact that from 1911 on there was, until recently, a decline in investments in railroad facilities and in the expansion of the capacity of the

railroads. Apparently, the railroad situation has so far been saved in this country by the reduction of ton mile costs through the untiring and persistent effort to increase the net tons per train mile, which has offset, to a considerable extent, the enormous increases in expenses that have resulted from other causes heretofore mentioned.

The following table shows the average net tons of revenue freight hauled per freight train mile and the total freight train miles for the years named:

Year	Net revenue tons per train mile	Total freight train miles
1890	175	435,171,000
1900	270	492,568,000
1910	380	671,258,000
1920	647	634,294,000

In 1921 the net revenue tons per train mile only decreased to 596 (or 8 per cent) in spite of a falling off of over a hundred billion ton miles (or 34 per cent) from the total of the previous year.

Total ton miles in 1910 were about 256 billion and in 1920 they had increased to over 411 billion, or 61 per cent. In spite of this increase, there was an actual decrease of 6 per cent in freight train miles. This performance is nothing short of wonderful and explains the principal reason for the vitality and strength of our transportation system which has been obliged to endure much. It is a grave question how long the railroads can maintain this wonderful financial resiliency.

The Savings from Heavier Train Loading

In arriving at savings on account of the handling of an equal, or greater tonnage with a reduction in train miles the items which vary with fluctuations in train miles have been selected from the analysis of operating expense of Class I railways for the year 1920, published by the Interstate Commerce Commission. The expenses under the various heads were apportioned to freight train service according to the method prescribed by the commission. The total of these selected items was found to be \$1,404,000,000 and represents 69 per cent of the total charges to the accounts from which

these items were drawn, the balance being chargeable to passenger and allied services and arbitrarily apportioned to such service, and a small amount is unrelated to either freight or passenger services. The total freight train mileage in 1920 was 634,294,101 so that the variable cost per freight train mile was \$2.21.

In 1910 the average ton miles of revenue freight per train mile was 380, and in 1920 it was 647, an increase of 267 ton miles, or 70 per cent. The total freight train miles in 1920 was 634,294,101, and if the trainload had not been increased, it would have required approximately 444,000,000 more train miles to have handled the net ton miles of 1920. Multiplying this by the variable cost per freight train mile in 1920, \$2.21, gives the astonishing total of \$981,240,000.

In my opinion, the building up, or increase, in train load has been due to increased weight of locomotives and, to some extent, to reduction of grades and elimination of curvature, but very largely to the supervisory movement for this

purpose that has extended throughout the country. The amount saved (\$981,240,000) is equivalent to a rate of return of over 5 per cent on the property investment in that year, and also on the tentative valuation of the Interstate Commerce Commission for rate-making purposes, \$18,900,000,000.

Railroads have also invested an enormous sum in passenger locomotives, facilities and equipment. If the subject of variable train mile costs were considered from a passenger standpoint as it has been from the standpoint of freight movement there would be a still further large sum for which the railroads would be entitled to receive credit on account of greater economy due to better devices and the superior quality of supervision with which they have been managed. The greatest reduction in expenses that has ever been secured in the operation of the railroads has been through the increase in train tonnage and the concurrent diminution in train mileage.

A Modified Plan for the Consolidation of Railroads

By John S. Worley

Professor of Transportation, University of Michigan

At present there are approximately 2,095 railway corporations in this country. Of this number there are, according to the Interstate Commerce Commission statistics for 1920, 186 Class I railways operating 183,352 miles of the total mileage 263,831. However, these statistics show that at present of the 2,095 corporations 961—Class I and others—are operated or so controlled as to closely approximate operation by only 87 of the Class I railways. The mileage operated by the 87 systems is 235,233, or 90 per cent of the whole mileage of the country. The 28,598 miles remaining represents 1,133 railways, some of which should become an integral part of any consolidation scheme and the remainder should be abandoned.

Consolidation is unification—the complete co-ordination, in large blocks, of every function of transportation. Unified operation within certain limits is certainly conducive of economy and efficiency, but that this principle holds true to unlimited consolidations, can properly be questioned.

The merging of our railways into 19 systems would make for a more efficient use of terminal facilities and yards. It would bring about the abolition of many off-line offices and would certainly simplify and reduce the expenses of inter-company accounting. It offers an opportunity for the reduction or abandonment of inspection forces now necessary where there is an interchange of interline equipment. However, the issue is at once raised, regardless of interline exchange, as to the desirability of this inspection to insure equipment being maintained to the proper degree.

It has been urged that the combining of our railways into 19 systems would result in large economies because of reductions in salaries of high officials. It is true we would have fewer railway presidents but many more general, regional and divisional executives with their staffs. The 19 presidents would certainly receive salaries far in excess of the average salaries now paid and the total salaries of the general, regional and divisional executives would be higher than at present. Arguments advanced for economies along this line appear to have little or no force.

It would seem that the standardization of equipment would offer a field for additional efficiencies and economies. However, here we find that it has been pointed out with much soundness, that the size, class and weight of equipment which is best for one railway is not the most efficient for another. The weight of evidence is in favor of limited standardization.

The short routing of freight and the routing of export

traffic to the best suited ports, which would result by having 19 systems, is a benefit against which there is no argument.

Consolidation of trainloads has received no small amount of attention as an advantage of the commission's tentative plan over the present but all who are familiar with railway operation know that on every railroad consolidated trainloads is a subject which has first place in the mind of every executive. It is not an innovation.

Much emphasis has been placed upon the economies to be obtained by consolidation of purchases on the theory that supplies, materials and equipment in large amounts can be made relatively for a much smaller sum than otherwise. Those who are familiar with this important branch of railway administration know the fallacy of such an argument.

That Government regulation would be greatly facilitated by fewer railway systems, there can be no question.

The advantage of cars "at home" is one to be recognized; however, at present this is being provided in a great measure by the Car Service Committee of the American Railway Association.

From the foregoing it is seen that there are decided advantages to be obtained by a more complete unification of our railways than now exists. Also it is seen that some of these benefits which have been suggested would accrue, already exist or become questionable.

The merger of our railways into 19 systems automatically establishes "absentee management." Centralization has been lauded and much emphasis placed upon the control of general policies which would be obtained thereby. However, its advocates, recognizing many of the weaknesses therein, give extended dissertations on "decentralization so as to create on different parts of the consolidated system distinct units of management, each of which would be virtually autonomous except in matters of general policy." We have to go back only three years to Government operation when we had this very type of railway administration. A most capable railway executive, recruited from one of our most efficiently operated properties, headed this organization, and railway executives of the highest character and broadest calibre filled every centralized and decentralized position and we know it did not work.

Large organizations, such as would be necessary if our railways were brought into 19 systems, have the serious handicap of obtaining their executives, administrative officers and employees by the "seniority" rule. Today on many of our large railways it is one of the most serious problems with

which the higher executives have to deal. Large organizations make it impossible for the higher executive to have personal knowledge of the abilities of his employees, so seniority and not ability governs where vacancies or new positions occur.

The Traditions of a Road

In light of the controversy which has existed between railway labor and the executives, it might appear that all tradition and spirit in our great transportation systems had passed. This is far from the fact. Executives and employees alike receive much inspiration from the traditions of the road. "The Road Of Anthracite," "The New Haven," "The Dixie Flyer," "The Century" are not empty phrases. The driving force of "Jim Hill," the kindness of "Ripley" and the vision of "Harriman" have inestimable value to those properties with which they are connected. The accomplishment of that almost insurmountable task of connecting Key West to the mainland is spoken of with pride by every employee of the Florida East Coast railway. Recently one road found that the "single narrow gold band" which had been removed from some of its locomotives was so valuable that it had this stripe of distinction repainted. No industry, railroad or other, can expect success which has none or has lost its traditions. The dismembering or bringing together of several of our railway systems tend to destroy traditions and spiritual life.

Had the 19 systems as now proposed passed through the development period as did our railways of today, and had these same 19 systems been conceived, organized, constructed and operated by a guiding hand which had full knowledge at all times as to our needs as of this time, it is obvious that they would be superior to our present systems. But that the present systems, the results of 90 years of development can be remade into 19 systems, superior to the present or without very, very great loss is indeed a grave question.

It must be recognized that this, as all other problems, will not remain dormant. What then would be a good policy to follow?

The first step should be voluntary completion of the con-

solidation of the 961 railway companies into the respective 87 operating companies, into 87 real systems each with a single operating system and a single financial structure. Contemporaneously or as conditions warrant there should be included in the 87 systems those of the 1,133 which are needed as transportation facilities, and the others which have no possible reason for existence should be abandoned.

Eighty-seven Systems Suggested

The 87 strong systems will say the inclusion of any of the 1,133 weak lines in their properties is a sacrifice for which there is no return. This is not entirely correct for these weak lines always have an indirect effect on the strong, and as the amount absorbed will be less than 10 per cent of the whole it is difficult to be impressed by this argument. Public welfare demands some sacrifice by the individual. The acquisition of this small amount of weak roads by the strong ones should be preferably by private agreement. In negotiating the agreement it should be done with charity by the strong and without avarice by the weak.

All progress, commercial and other, to be healthy and permanent must pursue natural courses. Progress must be by natural evolution and not by legislative force. Often it is necessary to have our legislative bodies provide the means and machinery to make possible the evolution, but the actual changes must be by natural processes. The present 87 systems have met to a very great extent all the requirements stipulated by Professor Ripley. Consolidations are already in a great measure perfected and Congress by the passage of the Transportation Act has made it possible to complete legally these mergers, which should be done. The Interstate Commerce Commission is fully informed of the principles to be followed that the "public interest will be promoted" and by its veto power can stop improper combinations. The consolidations which have been started with such new ones as conditions warrant should be completed, along a conservative plan, neither radical nor ultra-conservative, thus conserving all the traditions and other elements of value, by which processes the "public interest will be promoted" the best.

Principles of Terminal Station Design

By Alfred Fellheimer

Consulting Engineer and Architect, New York City

A passenger terminal improvement represents perhaps the largest single expenditure the railroad makes for an individual improvement, and the degree of skill with which it is planned to a great extent predetermines its future as an asset or a liability.

The preliminary examination must determine that the project satisfies the following conditions:

1.—That the improvement at the proposed site is desirable from the viewpoints of construction and operating costs and has advantages equal or superior in these respects to the results which can be secured at any other available location.

2.—That suitable development can be made in stages to meet the expected normal growth in the services involved for a sufficient term of years to justify the project.

3.—That the proposed improvement is desirable from the viewpoint of the municipality and in harmony with its plans for development.

4.—That the advantages offered to the public are sufficient to justify such concessions as may be required from the municipality.

5.—That the project in its entirety presents a sufficiently favorable economic aspect, free from insurmountable prior obligations, to insure its complete, rational financing.

6.—That the by-products of the development such as the overhead or air rights can be utilized in a practical and profit-

able way so as to absorb, or at least substantially reduce, the carrying charges of the improvement.

7.—That the project as planned is so sound and free from imposing burdensome conditions upon the railroad, that controlling or governing bodies will readily approve same.

8.—That the cost of the station facilities per car unit and their operation will not be excessive in comparison with that of other sites. This is particularly important for locations so restricted in area that double-deck structures may be necessary to secure required capacity.

9.—That the improvement is of such type that adequate enhancement of land values within the terminal area will necessarily follow.

Specific Requirements

The foregoing broad principles being satisfied, the basic idea must be in harmony with the following:

Except at new locations, the plan must, in its general conformation, fit in with existing conditions to a sufficient extent to permit of gradual transition into the complete or final plan without serious disturbance of operation, and in such stages as will conform with the development of railroad traffic and contiguous property. Obvious economic and practical reasons make this imperative.

It must strike a proper balance between the public comfort and convenience on the one side, and economy in both

first cost and subsequent operation on the other. This insures good will on the part of the public, and efficient and liberal service on the part of the railroad.

The general layout must be orderly and direct in the placement of its principal parts, because in a project of large dimensions and scope, freedom from disorder and confusion is in direct proportion to the simplicity of the plan.

The railroad facilities provided must co-ordinate with the complete development of streets and blocks throughout the terminal conforming with the civic plans for unrestricted expansion of the city adjacent to or across the terminal area. This will benefit both the railroad and the public.

Facility of adjustment to future requirements must be arranged for, because the useful life of railroad facilities is limited by obsolescence rather than by physical decay. Such facilities, therefore, can be considered stable or permanent only insofar as they are adjustable to changing conditions. This applies with special force to terminals which must, in their initial stages, be operated by steam.

Definite determination must be made of the adequacy of approaches, throats and yards, to assure ample capacities of trackage, all in proper balance, thereby making possible a high degree of operating effectiveness.

Selection of Characteristic Basic Types

After the plan has been proven to be in accord with the preceding requirements, determination must be made of certain characteristic basic types, as follows: (A) Through or stub type, as affecting train operation, and (B) headhouse type, as affecting station operation.

The through type is concededly best adapted for efficient and rapid train handling, and is, therefore, where choice can be made, the type to be selected unless a careful investigation of all the elements affecting the correlated and dependent facilities, fails to disclose the necessary preponderance of factors in its favor.

The stub type can, where the conditions permit, be given some of the special advantages of the through type of providing a loop or engine release arrangement. In the stub type of terminal, except in cases where there is a difference between street and track level, the platforms and other facilities can be arranged at one level. This results in advantages as follows: 1.—Highest total efficiency in operation and the greatest convenience to the public. 2.—Freer and faster travel on platforms, unencumbered by stairs or ramps. 3.—Practical elimination of vertical travel of passengers between streets and platforms. 4.—Economy in construction cost, maintenance, and operation. The short haul (suburban) traffic with its intensive service requirements should, wherever possible, be provided with means for through or continuous train operation.

A definite selection must be made of one of the three general types of head-house before proceeding with the consideration of the arrangements of the detail features:

1.—Waiting room type of head-house, where the waiting room is made the focal center of the station, with all dependent facilities such as ticket office, baggage and check rooms opening directly therefrom and with separate passenger concourse for access to train platforms. The Washington Union Station is an example. (This arrangement tends to make the main waiting room a thoroughfare between the street and the trains.)

2.—Concourse type of head-house, where a large general passenger concourse is provided for the mass movement of passengers, with ticket office and other dependent facilities opening directly therefrom, the waiting room with its auxiliary facilities being placed adjacent to but separate from the concourse. The Grand Central Terminal, New York City, is an example. (This type tends to minimize conflict of foot passenger traffic.)

3.—Composite type of head-house, where a large room is provided exclusively for the sale of tickets, checking bag-

gage and like dependencies, with separate waiting rooms and passenger concourse. The Pennsylvania Station, New York City, is an example. (This type tends to create cross-currents of travel between the various station facilities.)

Traffic Considerations

Although station facilities should be planned to accommodate anticipated traffic, it is not essential to provide for extreme peak conditions, because, in a well planned station, an overload can be carried by all facilities for occasional periods without undue operating stress or inconvenience to the public.

The general arrangement should invite movement of foot traffic along natural and direct channels so that passengers may, as far as practicable, avoid crossing the main travel routes and the retracing of steps. Where established lines of city foot traffic are permanently interrupted by the terminal construction, provision should be made to accommodate this traffic without interfering with the normal use of the station.

The separation of suburban and through traffic should be effectively accomplished in order to avoid confusion and expedite the movement of both classes of traffic. It is not essential that entirely separate concourse, waiting room and general facilities be provided. It is necessary, however, that the main channels of circulation be completely separated.

Although it is desirable to separate the passenger foot traffic channels and allocate sections of the terminal facilities to inbound and outbound traffic, no physical division should be planned in the track layout that will limit interchangeability and elasticity.

The baggage facilities for receiving, delivery and storage should be separated. Trucking subways, bridges and other passageways may be used in common.

Adequate provision should be made for the public and private vehicular traffic in suitable relationship to station facilities.

In addition to access to streets, convenient entrances and exits should be provided for interchange of passengers with surface car lines or other local transportation systems.

The plan should provide for direct contact with all natural points of entrance and exit rather than force the diversion of traffic to points dictated purely by the necessities of the architectural composition.

Provision should be made for direct traffic contact with the passenger platforms. Where this traffic is in solid trains, consideration should be given to its location outside the terminal.

Where the terminal plan includes provision for freight traffic, this portion of the layout should be entirely segregated from the passenger facilities and, as far as possible, all freight driveways should be separate from the main streets or thoroughfares, in order to minimize the interference in the operation of these facilities with passenger and public traffic.

Station Facilities

The various facilities comprising the station proper must be placed in the natural and orderly grouping which their logical related uses dictate. The individual sizes of adjacent facilities should permit modification, if future requirements so dictate, without seriously disarranging the general co-ordination of the plan.

The passenger concourse should be roomy and entirely enclosed with weather-tight gates at the train platforms. These train gates should preferably be in a continuous line on one side of the concourse. The concourse should be free from confusing changes in direction; ample and direct access should be provided from the concourse to strategic street points and the various station facilities.

The waiting room should be arranged to be conveniently accessible for patrons from the street and station facilities without inviting usage as a thoroughfare, with all facilities for the comfort and accommodation of waiting passengers

located adjacent and readily accessible. The location should permit of adequate ventilation and daylighting.

The ticket office and checking facilities should be placed in contact with, but not encroaching upon the main routes of travel between streets and trains, so that persons not requiring these facilities may pass without conflict with passengers buying tickets or checking baggage.

All working facilities should be provided with conveniences and equipment required to insure the full working efficiency and comfort of the employees.

Revenue-producing facilities conducive to the comfort and convenience of the passengers should be located along the main arteries of travel, placed so as not to reduce the effectiveness of station operation. Their arrangement should insure maximum patronage from the general public and railroad patrons, thereby enhancing their rental value.

The elaboration of the architectural features of the design should reasonably express the purpose of the improvement and emphasize the relative importance of entrances, exits and like features. Attention should be paid to mass effect which attracts the notice of the general public rather than to details which are seen or appreciated only by a few. Economical consideration should be a definite aim throughout including the avoidance of especially elaborate constructional detail.

The station plan should impose on the office building no limitations which will exclude any essentials needed to assure successful competition with similar commercial buildings.

Where the character of overhead buildings can be predetermined, as requiring contact with the station, freight or other facilities, it should be provided for: Otherwise flexibility should be given, making possible future conversion to suit the requirements.

Platforms and Ramps

Platforms should be level with the car floor especially for suburban service. If conditions compel the use of low platforms, provision should be made for future conversion to the high type.

Where the width of platform is restricted by the need for intensive development of the property, the minimum should permit passengers to pass freely between loaded baggage trucks when placed along either side of the platform.

Means should be provided to avoid trucking across platforms and tracks.

Baggage elevators should not be located in narrow platforms except at the outer end. When placed at the concourse end they should not obstruct circulation. The enlargement of platforms at the concourse end known as the "Midway" provides space for the location of elevators, stairs, and similar facilities without encroachment upon the concourse or interference with public circulation, and permits the use of several train gates at one time in speeding the exit of arriving passengers.

Separate baggage platforms are not ordinarily necessary. The handling of baggage on passenger platforms causes slight interference with passenger traffic. Suburban trains carry practically no baggage. Inbound long-distance trains normally occupy the platforms for a considerable period beyond the short interval required to discharge the passengers. Passengers for outbound long-distance trains are so thinly distributed that no appreciable interference results. However, if such platforms are provided at all, they should be of ample width, as narrow ones will be useless.

The spacing of platforms and tracks, particularly if lines of columns are necessary, should be designed to permit ready rearrangement of platform widths to meet future needs.

Column lines for superimposed structures in the absence of controlling conditions to the contrary, should be located in the platforms instead of between tracks thereby reducing danger to overhead structures, increasing the view for operation, adding to safety and facilitating maintenance. Columns

in platforms interfere but slightly with passenger movement, with small loss of space, whereas, when between tracks, the space is entirely lost.

Where the tracks and streets are necessarily at different levels, the vertical travel, if possible, should be by means of ramps, rather than by stairways. In general, ramps permit more rapid circulation, cause less fatigue and minimize accidents. Where the foot of ramp extends several car lengths or more from the station end of a narrow platform, provision should be made to avoid backward travel of arriving passengers.

Track Facilities

A reasonable proportion only of the station tracks need be of sufficient length to accommodate the longest trains that present power can handle, plus an allowance for increase.

Excessive rates of curvature and grades should be avoided as interfering with effective and safe operation; and tracks along platforms, especially of the high type, should as far as possible, be straight. Where overhead building construction is contemplated, the track spacing and location of special work should afford reasonably free opportunity for placing of columns and avoidance of long building spans. Where conversion from steam to electric power in the future is a possibility, provision should be made to permit the installation of electrical features affecting the track and platforms.

In addition to the usual provisions for changes due to temperature, all buildings the rental value or use of which is adversely affected by excessive vibration should, as to their foundations and other structural parts, be entirely separated from similar parts in other buildings or structures through which directly or indirectly the vibration due to rolling or live load may be transmitted. Columns at track level where necessary should be protected by suitable collision piers to prevent failure through derailment, and should never be located in the direct line of the track immediately beyond a bumping post. The choice of type of future electrification, if initial operation is by steam, should not be hampered by any structural limitations, such as insufficient headroom.

Provision should be made for the location of all auxiliary operating facilities such as signaling, central plants, substations and equipment, entirely separate from the station facilities wherever possible but accessible to same. In determining the proper location, due weight should be given to the influence of all economic elements such as land values, economy in handling supplies and waste material, and load distribution.

Averages and statistics derived from other terminals, while interesting and helpful, have no final determining value. The facts of record at the terminal under consideration must finally govern. Each facility must be tested by the actual local requirements. Consequently when the general design has been accomplished, it is imperative that the final test as to load co-ordination be applied to determine: That all parts are in balance; that no individual feature is under or over developed; and that all features will simultaneously reach the saturation point.

To accomplish this, an analysis should be made of the operating capacity of the approach tracks, throat tracks, and body tracks, as a proper balance of these facilities is of vital importance. Likewise the relative values of practically all supporting facilities in the plan should be measured and balanced to safe-guard the successful future of the development.

As an example, the ticket office size and number of selling windows, can be definitely arrived at as they have a fixed relation to the number of outbound passengers of all classes handled which is, in turn, determined by the ultimate saturation point of the track facilities used for outbound cars.

Other papers presented at the convention will be published in a subsequent issue.

Injunction Against Strike Violence Made Permanent

THE TEMPORARY INJUNCTION against violence in the strike of the Federated Shop Crafts which was granted last October was made permanent by Judge J. H. Wilkerson of the United States District court at Chicago on July 12. By this order, which is one of the most sweeping and drastic restraining orders ever issued by a court in this country, the members of the Federated Shop Crafts, their officers and other affiliated bodies of the American Federation of Labor are restrained for all time from hindering or obstructing the railroads engaged in interstate commerce, from conspiring or confederating to injure the railroads, and from loitering or unnecessarily being in the vicinity of railroad property.

Attorney General Daugherty in Washington declared that the permanent injunction meant that "no extensive strike tying up interstate commerce will ever again take place in this country." Donald R. Richberg, counsel for the Federated Shop Crafts, commented that the labor organization is content to accept the injunction and has no intention of carrying the question of its legality to the Supreme court. Mr. Richberg deprecated the importance of the injunction, contending that it sets no precedent and is of no permanent value except as it applies to eventualities directly connected with the strike which was called in July.

Under the terms of the final decree making permanent the "Daugherty injunction" railroad strikers, actual or potential, are specifically restrained from:

Interfering, hindering or obstructing railroad companies, their officers or employees, in their operations and performance of public duties involving the construction, inspection, repair, operation or use of trains, locomotives, cars or other equipment;

Preventing, or attempting to prevent any person from entering or continuing in the employment of the carriers;

Conspiring, combining, confederating, agreeing and arranging to injure, interfere with or hinder the railroads by the making of threats, intimidation, acts of violence, opprobrious epithets, jeers, suggestions, of danger, taunts, entreaties or other unlawful acts;

Loitering in the vicinity of the property of the roads for the purpose of abetting, directing or encouraging by letters, telegrams, telephone, word of mouth or otherwise, any person to do any unlawful act;

Trespassing, entering or going upon the premises of the railroads without their consent where employees are engaged in constructing, inspecting, overhauling or repairing locomotives, cars or other equipment, and

Congregating or maintaining, or directing, aiding or encouraging any act of guarding, picketing or patrolling any yards, shops, depots, terminals or other premises of the railroad companies.

The famous "Daugherty injunction" was first granted by Judge Wilkerson in an interlocutory restraining order on September 1, 1922, when acts of violence by striking shopmen assumed proportions which threatened the continued operation of the railroads. Arguments by the union to dissolve the temporary decree began on September 11, but the plea was denied by the court. The hearing on the making permanent the temporary injunction began on May 1. At this time counsel for the union withdrew from active participation in the case.

Represented by Assistant Attorney General Blackburn Esterline, the government submitted a mass of evidence consisting of 181 exhibits comprising 250 affidavits submitted on and after September 12, 1922. The testimony of 725 witnesses was taken, establishing the fact that the total cost

of the walkout amounted to \$96,501,376 on 50 representative roads. This figure is the total of the amount expended and does not include damages to property, loss of business incurred, increased cost of operation nor loss by damage claims.

It was shown that 19 deaths had occurred during the walkout due to violence and assault by strikers and there were more than 1,500 instances of various kinds of attacks by strikers on employees. There were 65 cases of kidnapping with accompanying brutal assault; eight cases of tarring and feathering of new employees; 50 burnings and dynamitings or such attempts on bridges over which trains operated; 50 cases of derailments or attempts by greasing tracks, placing obstructions thereon, removing spikes, interfering with frogs and switches, cutting wires and signal apparatus, slicing of air hose, throwing of stones, firing of shots, placing foreign substances in pipes, cylinders and other parts of locomotives, tampering with electrical equipment, removal of necessary parts of locomotives, and the placing of emery and other foreign substances in journal boxes.

In his ruling Judge Wilkerson concluded as follows:

"This strike was more than a controversy between employer and employees. Its manifest purpose, as shown by the evidence, was to cripple and destroy interstate commerce, and to create by this assault a public opinion hostile to the decision of the Labor Board. The primary purpose of the combination, therefore, is unlawful, and it may not be carried out by means that otherwise would be legal.

"Even if the strike is regarded merely as a controversy between employer and employee, the evidence shows beyond doubt that it was part of the purpose of those engaged in this combination to carry on the strike by assaults and acts of violence. Certainly upon such a showing the injunctive relief will not be limited to forbidding acts of violence which are done in secret, and for which it is hard to fix responsibility and to impose punishment, and thus leave defendants free to encourage injury to persons and property by open words and deeds which in themselves appear peaceful and lawful.

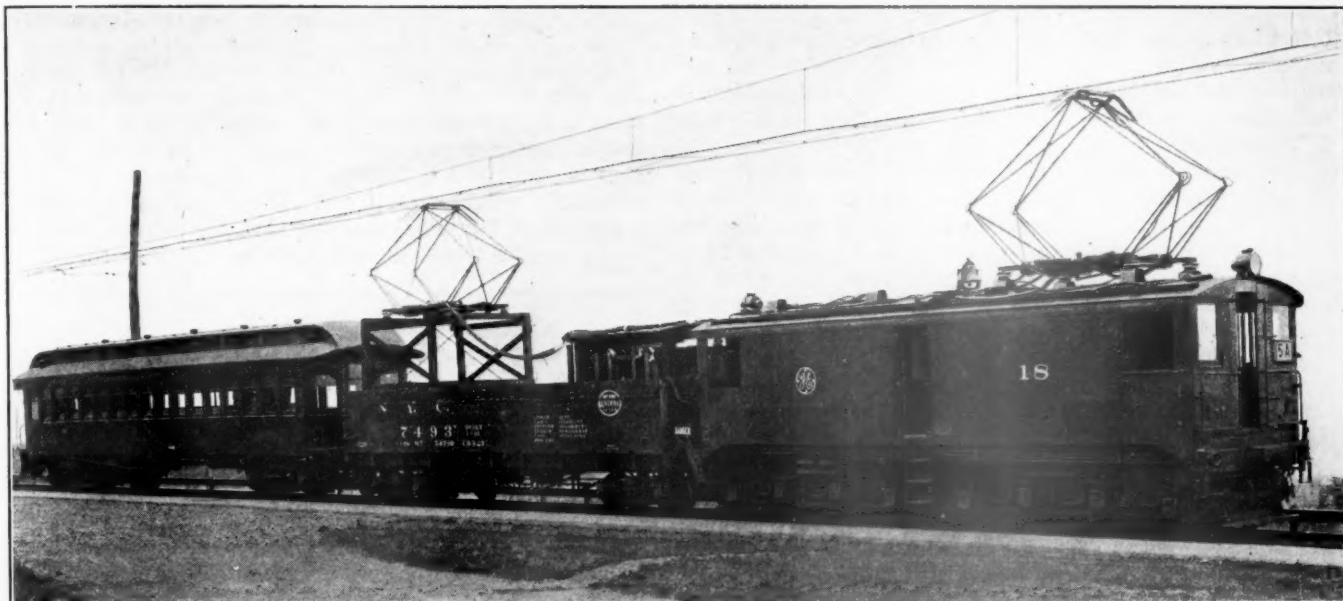
"But, passing the purpose of the conspiracy, it is a misnomer to characterize any of the acts of the defendants as 'peaceful.' The 'peaceful' words of the strikers and pickets, the 'peaceful' exhortations of the strike leaders, take on, by virtue of the atmosphere of lawlessness and violence in which they are spoken, a force not inhering in the words themselves, and therefore transcending any possible right of free speech.

"Under such circumstances they become what have been called 'verbal acts,' and as much subject to injunction as the use of any other force whereby property is unlawfully damaged.

"To undertake to throw around the so-called 'peaceful' words of those engaged in this violent assault upon the commerce of the nation the protection of the doctrines of free speech and peaceable assembly, is a perversion of those great constitutional guaranties. A decree with provisions the same as those contained in the temporary injunction is the least that can be granted to the plaintiff under the showing in this case."

THE MECHANICAL DIVISION of the American Railway Association has four scholarships at Stevens Institute of Technology, Hoboken, N. J., two of which will be vacant this month. These scholarships are available for the sons of members of the division and cover the regular tuition charges for a four-year course, leading to the degree of Mechanical Engineer (M. E.). The course offered also includes instruction in electrical, civil and other branches of engineering.

Applications for these scholarships should be in the hands of V. R. Hawthorne, secretary, as promptly as possible. In case there are more than two applicants, they will be given to the two passing the entrance examination with the highest standing.

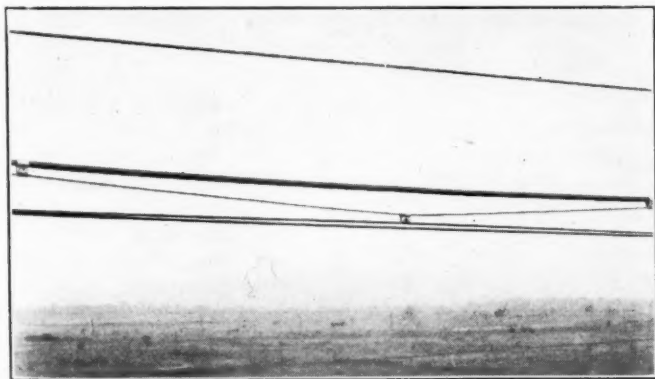


Train Used for Making Current Collection Tests

Trolley Construction for Heavy Electric Traction

Currents Exceeding 5,000 Amperes Collected by a Single Pantograph Without Sparking

A NEW TYPE of overhead trolley construction has been developed by the General Electric Company which is extremely flexible and which makes possible the collection of currents of more than 5,000 amperes from a single pantograph. A series of tests to show the qualities of



A Section of the Overhead Trolley Construction

the overhead construction were made during this week on test tracks at Erie, Pa., for the benefit of a large group of invited guests.

The test train consisted of a 110-ton passenger type locomotive arranged for operation on 750 or 1,500 volts and equipped with four bipolar gearless motors, a gondola and a New York Central observation coach. On account of the short length of the cab, the second pantograph was mounted on the gondola to simulate operating conditions. The normal pressure of the pantograph against the trolley wire was between 30 and 35 lb. By means of remote controlled contactors, sections of loading grids indicated in the gondola were inserted or removed so as to draw whatever current was called for under each particular test.

Some of the guests were invited to ride in the locomotive cab. Others rode in the observation coach which was equipped with indicating instruments to show the amount of current collected and the speed of the train.

Five tests were made as follows: 1. With the train running at 60 miles an hour, one pantograph was used to collect 4,000 amperes at 1,500 volts. 2. At a speed varying from 50 to 60 miles an hour, one pantograph was used to collect 4,000 amperes at 850 volts. 3. At 30 miles an hour, two pantographs were used to collect 5,000 amperes at 850 volts. 4. At 60 miles an hour two pantographs were used to collect 5,000 amperes at 850 volts. 5. At 58 miles an hour one pantograph was used to collect 5,400 amperes at 850 volts. It was necessary to make the higher amperage tests at the lower voltage because of the limited power available. Witnesses of the tests stationed on observation towers remarked on the complete absence of sparking.

To provide facilities, the General Electric Company made use of the eastern division of the East Erie Commercial Railroad. These tracks are equipped with up-to-date overhead line construction and third rail and are supplied from a substation with whatever trolley voltage may be required.

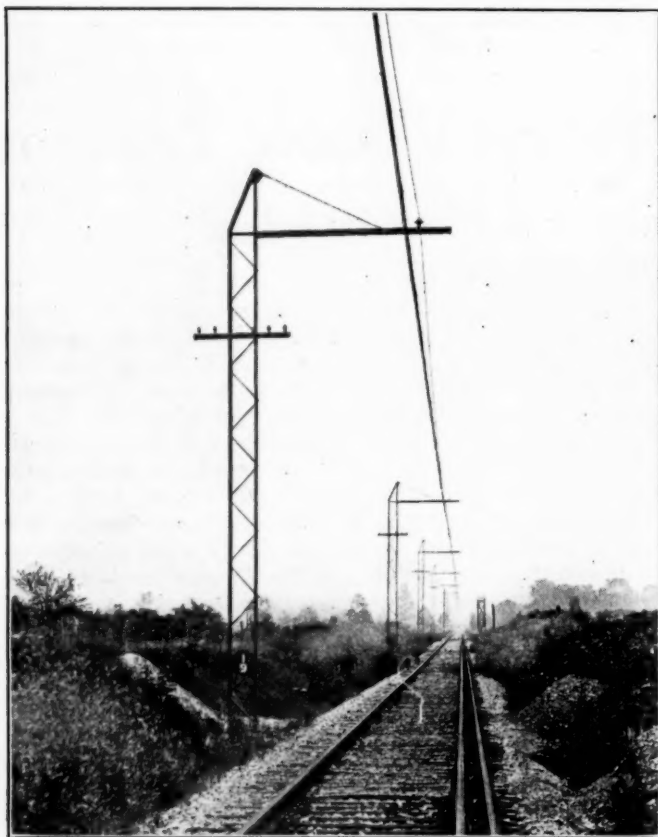
That portion of the track which is used for testing purposes is at present $2\frac{3}{4}$ miles in length. An extension is now under construction which will give a total length of $4\frac{1}{4}$ miles. The length of track used for high speed running is about $2\frac{1}{2}$ miles long, the remainder being used for slowing down the train. Included in this high speed section, there is one mile of level tangent track. Beyond this tangent there is a slightly ascending grade with curves of from 1 to $1\frac{1}{2}$ deg. The rail used is of 100 lb. section which is laid with 24-in. tie spacing in slag or stone ballast. There is also about one mile of extra rail which is used for testing odd gage locomotives.

The working conductor is located 22 ft. above the rail. The overhead construction is compound catenary with a steel messenger and a secondary copper messenger to which is

"laced" duplex copper working conductors. The two contact wires are supported at alternate points by the lacing. A portion of the secondary messenger is 1,000,000 c.m. copper and the remainder 750,000 c.m. The overhead line is fed at one point from the substation in building No. 60 of the G. E. plant.

The steel supporting structures begin about 600 ft. west of the substation with latticed column bridges extending up to bridge No. 13. Bridges No. 14 to 18 inclusive, are Bethlehem column bridges. The structures from No. 19 to 23 are latticed channel bracket poles; from No. 24 to 28 inclusive, 10-in. Bethlehem bracket poles; from No. 29 to 33 inclusive, 9-in. Bethlehem bracket poles. Bridge No. 34 is latticed column type used for an anchor. The steel structures are spaced 300 ft. throughout. All of the steel structural work was supplied by the Archibald Brady Company, Syracuse, N. Y.

The primary messenger consists of a $\frac{5}{8}$ -in. 7-strand high strength steel cable, from structure No. 1 to 34. The secondary messenger is a 1,000,000 circular mill stranded copper cable between bridges No. 1 and 15, and a 750,000 circular mill stranded copper cable from bridges No. 15 to 34.



Four of the Supporting Structures Are Latticed Channel Bracket Poles

From bridges No. 1 to 16 and from No. 20 to 34, the working conductor consists of two 0000 grooved hard drawn copper wires hanging side by side. From bridges No. 16 to 20 two 000000 copper wires are used.

The laced suspension is installed throughout with a No. 0 stranded copper cable supporting the working conductors from the secondary messenger. Droppers from the primary messenger support the secondary messenger at points 30 ft. apart. The working conductors are supported from the secondary messenger by clips spaced 15 ft. apart on each wire.

To permit witnessing conveniently the current collection observation towers had been erected to a height of approxi-

mately the top of the pantograph, at various points along the track.

The substation contains two synchronous motor generator sets with switching equipment suitable for connecting these units to supply any trolley potential from 600 to 3,000 volts. One of these sets has a rated capacity of 1,000 kw. and consists of two 500 kw. 1,500/3,000-volt generators direct connected to a synchronous motor. The second unit is of similar construction but with two 750 kw. generators. Full capacity can be obtained with both series and parallel con-



Latticed Column Bridges Are Used to Support the First 13 Spans of Overhead Trolley

nection, and lower voltages can be obtained by adjusting the rheostats in the generator fields. Both of these sets are designed to operate at three times normal load for short periods, and a total of 6,000 kw. can be obtained, the limit of the power supply.



Charts, Graphs and Pictures Explain Railroad Operation—the New York Central's "Service-Progress" Special

I. C. C. Statistics and Operating Efficiency

Certain Fundamental Principles—Is Analysis Necessary to Distinguish Efficiency and Underlying Advantages?

By J. E. Slater

Special Assistant to General Manager, N. Y., N. H. & H.

DURING THE LAST FEW YEARS, the volume of statistics which have been required of the railroads by governmental authorities, and especially by the Interstate Commerce Commission, has greatly increased. This is particularly true of the statistics of operating performance. Although these figures were required by the Interstate Commerce Commission for the purpose of checking the financial and operating performance of railways, they are available to the public. As a result, these statistics are used by four groups: First, the Interstate Commerce Commission and other governmental authorities; second, by the railroads themselves; third, by experts of financial houses, and fourth, by the general public.

In making use of these statistics, the Interstate Commerce Commission has the benefit of the services of statisticians trained in the railroad field who have knowledge of railway operation and can intelligently use the data available. Likewise, the railroads can make effective use of these statistics and can avoid the fallacious conclusions drawn from them, although it must be admitted that railroad men themselves sometimes fall into some of the fallacies which beset an analysis of these figures.

The third and fourth groups, however, frequently do not have the benefit of minds trained in the use of operating statistics, and it is not strange that conclusions as to efficiency of operation should be drawn which are frequently far wide of the mark. As a result, information as to a railroad's operating efficiency, based upon its published reports, is sometimes given out with conclusions which has no real basis of fact.

It is the purpose in this article to analyze the statistical indices provided in the reports made by the railroads to the Interstate Commerce Commission, and to point out certain fundamental truths which must be constantly borne in mind in the use of these statistics.

In the first place, these comments should in no way be taken as a criticism of the statistics which are called for. The OS reports which were inaugurated under the Railroad Administration constitute an excellent index of various phases of railway operation. Likewise, the present OS forms which are, in a large degree, a condensation of the forms used by the Railroad Administration, furnish a great deal of data very valuable to the railroads themselves as well as to the Interstate Commerce Commission and the public. The same applies to the various statistics which are shown in or which can be derived from the annual reports of the railways to the commission. These reports furnish the railways themselves a basis of comparison as between railroads which are of interest and of value, and it is hoped that they will be continued in the same form over a sufficient period of time that valuable comparisons with previous periods will be available. It is believed, however, that a great deal of erroneous and fallacious information is given out based either upon a deliberate or unintentional misunderstanding of these statistics. These fallacies are frequently based upon the failure to take into account one or more of certain fundamental truths which must constantly be borne in mind in dealing with railroad statistics. Of these, there are three of particular importance:

1. *Railroad statistics are not only a measure of operating efficiency, but even more frequently an index of operating handicaps.*

2. *In measuring operating efficiency, analysis must be made not of one, but of all of the factors available.*

3. *In any analysis of railroad statistics, consideration must be given to the influence of the fixed nature of a large portion of the expenses.*

With the statistics for various railroads now available, there is a natural tendency on the part of all interested to compare results on different lines. This is a profitable pursuit, but often it leads to erroneous conclusions. Too frequently it is assumed that if one railroad can operate with a certain train load, car load, miles per car per day, or operating ratio, other railroads should be able to do the same. One of the best examples of this fallacy is the claim made by Senator Couzens that if all of the large systems could operate with the same units of performance as the ten systems having the best performance in these units, there would be a saving of hundreds of millions of dollars. It would be just as reasonable to claim that if the farmers of New England could produce as much per acre as those of the Middle West, New England would be self-supporting in its food supply. The facts are, of course, that the fundamental conditions with which the New England farmers have to deal make this impossible. The same is true in the conditions on different railroads.

This statement of Senator Couzens fails utterly to take into account the operating and traffic conditions affecting certain railroads as compared with those affecting others. It fails to take into account relative physical handicaps such as grade and curvature and traffic considerations, such as the character of the traffic, the difference in the relative quantities of certain important commodities such as coal and ore, or merchandise and less-car-load freight. It fails to take into consideration differences in the amount of freight originating on, terminating on or overhead to that line. It fails to take into account the relative diversity of traffic, the relative density of traffic, the relative proportion of branch lines and other light traffic lines. All of these facts and many others are fundamental in limiting the performance which can be attained. The various operating statistics, therefore, more clearly measure the relative differences in operating handicaps than the efficiency with which these handicaps are overcome.

In measuring operating efficiency, analysis must be made not of one, but of all of the factors available.

When statistics are so numerous there is a great tendency to limit the factors analyzed to one or two units and to use these units as the sole basis of conclusion as to the operating efficiency of a railroad or group of railroads. There is no doubt but that it would be extremely helpful if there were one or two units which could be used as a guide in measuring results. In the analysis of operating efficiency, however, such simple indices have not been developed. While an excellent performance may be indicated in one unit, investigation will develop that this was made at the expense of other groups of expenses which are of equal or greater importance. For example, a railroad may be increasing its train load to such an

extent that the average speed of trains is decreased to an even greater amount with the result that the cost of freight train service per ton-mile is actually increased.

Obviously, train load of itself cannot be used as a measuring stick. Likewise, a railroad may be making an excellent showing in its car movement as shown by its miles per car per day, while at the same time, its train load is suffering on account of the additional trains run to reduce intermediate terminal delay. Even railroad men frequently fall into this fallacy and point with pride to certain performances when a further analysis will indicate that such performance was made at the expense of some other equally important operation.

Obviously, it is necessary to check all of these items before judgment is passed upon the general operating efficiency of a railroad's staff.

In any analysis of railroad statistics, consideration must be given to the influence of the fixed nature of a large portion of the expenses.

If there is any one factor which sets apart railroads and other public utilities from other industries, it is the very large amount of fixed expense necessary for operation. This fixed expense is due to two factors; first, in the large plant necessary to conduct the operation, and second, in the minimum amount of service which must be provided the public regardless of the net revenue which is derived from such minimum service. Various estimates have been made of the fixed amount of railroad expense. It is conservative to say that from 40 per cent to 50 per cent of the expenses vary little, if at all, with the amount of traffic. With small increases or decreases in traffic, this percentage is even greater. This fixed element of expenses extends not only to what might be termed overhead expenses such as supervision, and to a large portion of maintenance-of-way expense, but even to train expenses which are usually looked upon as expenses which vary with traffic.

On a railroad similar to the New Haven which has many branch lines and light traffic lines, a large amount of service, both freight and passenger, must be maintained as a minimum for the public convenience. Moreover, on the main lines, regardless of the amount of traffic, local freight trains must be run with reasonable frequency. On the New Haven, 35 per cent of the freight train mileage is made up of local freight trains. It is obvious that a substantial portion of the freight train expense is fixed. The same factor applies to an even greater extent in passenger service. A large element of yard and station expenses is also fixed, this applying particularly to the smaller units. The fixed nature of these expenses is of the greatest importance in consideration of the fluctuations from one period to another and the relative changes from one period to another on different railroads.

The result of these fixed expenses is that the net result of operation in two periods frequently shows a very much greater change than the efficiency with which the two operations were handled.

In addition to the three principles which have been described above, one other point should be made. The investor in a railroad is primarily interested in a railroad's earning power and the protection of his income. The expert in a house dealing with securities of a railroad is likewise interested in these factors. These men are interested in the efficiency with which a railroad is operated only to the extent that such efficiency is expressed in terms of net income. This is no criticism of this point of view. Too frequently, however, it happens that this point of view is translated into an attitude toward operating efficiency. The handicaps faced by a management may be met and surmounted with far greater efficiency than is indicated by the financial results. The converse may also be true. On the other hand, knowledge as to the real operating efficiency is valuable to these men, especially as it may foretell in the distant future favor-

able financial results long before such results are shown by the current reports.

Operating Ratio of Limited Value

as Index of Efficiency

The effects of the three fundamental principles which have been outlined are well shown in the comparison of the various statistics given in the monthly report of revenues and expenses made by the railroads to the Interstate Commerce Commission and given wide publicity. This statement gives the operating revenues, the operating expenses by general accounts, taxes, joint facility and equipment rents, the net railway operating income and the operating ratio. The operating ratio is a unit which has long been used. The fallacies of its use have frequently been indicated. There is no doubt that the operating ratio is a valuable unit in checking financial results. As a measuring stick of the comparative operating efficiency of different railroads, it is almost worthless and in the comparison of the operating efficiency of an individual railroad in different periods, it must be used with great caution.

The operating ratio is one of the best examples of the principle outlined above, namely, that operating statistics are just as much a measuring stick of a railroad's disability as of its efficiency. In using the operating ratio as an index of efficiency, another fundamental principle of statistics is lost sight of. This principle is that since a ratio is composed of two factors, changes in the ratio may be caused by either of these two factors. An increasing ratio may be brought about either by increasing expenses or decreasing revenues. In the comparison of the ratio of two railroads, a higher ratio on one railroad may be brought about either by high expenses or low revenues. In considering the operating ratio as an index of efficiency, the effect of revenue on the ratio is completely ignored. It is a fact that the ratio is more frequently affected by the revenue factor than by the expense factor. An example of this is given below in the statement covering the ton-mile revenue and ton-mile expense in freight service and the operating ratio for eight standard eastern railroads.

Railroad	Ton-mile Revenue (Cents)	Ton-Mile Expense (Cents)	Oper. Ratio (Per cent)
A	1.833	1.374	75.0
B	1.531	1.140	74.5
C	1.430	1.095	76.6
D	1.286	1.109	86.2
E	1.273	1.012	79.5
F	1.209	1.068	88.3
G	1.142	.933	81.7
H	1.110	.980	88.3

This table indicates that the cause for low operating ratios is high ton-mile revenue rather than low ton-mile expense. The three railroads having the lowest operating ratios are those which have the highest ton-mile earnings. Yet, the railroad having the lowest ton-mile expense is fifth from the lowest in ratio, while the railroad which is next to the lowest in ton-mile expense has the highest ratio. The two roads having the highest ton-mile expense have the lowest operating ratio on account of the fact that their ton-mile revenues are very high. Surely, in this case, the operating ratio gives no indication of the relative economy of operation.

A very striking example of the fact that the ratio is not a good index of economy was developed in a comparison of the results on two railroads in trunk line territory. The character of the business handled is the same, the operating characteristics are the same, both have expensive New York terminals, both handle a large amount of coal traffic and both have a large amount of through freight business with a long haul. The operating ratio of one of these railroads was 88 and the other one 74. The transportation ratio of the first was 44 and the second 38. A detailed check by primary accounts indicated that in all but one of the important groups of expenses under maintenance of way, maintenance of equip-

ment and transportation, the first road operated at a lower unit expense than the second. The differences were particularly noticeable under the transportation expenses, the unit costs of the first road being in many cases, 25 per cent less than the unit cost of the second road. In spite of all these facts, the operating ratio for the first road was 14 points higher than that of the second. This was due entirely to the fact that the ton-mile earnings of the second road were $37\frac{1}{2}$ per cent higher than the ton-mile earnings of the first road.

Limitations in Use of Transportation Ratio

The same general principles that apply to the operating ratio apply to transportation ratio. This is indicated in the table shown below for the same railroads for which the operating ratio is shown.

Railroad	Ton-Mile Revenue (Cents)	Expense per Ton-Mile (Cents)	Transportation Ratio (Per cent)
A	1.833	.661	36.1
B	1.531	.583	38.0
C	1.430	.537	37.6
D	1.286	.506	39.3
E	1.273	.456	35.8
F	1.209	.534	44.2
G	1.142	.480	42.0
H	1.110	.490	44.1

Not only does the operating revenue have a material effect upon operating and transportation ratios, but there are other controlling factors which have nothing to do with operating efficiency. In a comparison of two railroads, consideration must be given to the operating handicaps which must be overcome by the railroad staff. These handicaps are frequently inherent in the railroad's line and can only be partially overcome by differences in operating methods, by extensions and improvements, and by an adaptation of the entire operating scheme to the conditions found. This is as far as the railroad officers can go, and if they perform their duties in this respect and their costs are still high, this does not mean, and should not be considered to mean, that their operating efficiency is less than that of a neighboring road which does not have these handicaps. These handicaps, as previously mentioned, include physical characteristics, such as grade and curvature; traffic characteristics, including traffic density; diversity of traffic, as compared with concentration of traffic; number of light traffic lines which must be maintained and operated in the public interest; the amount of traffic originating or terminating on that railroad's line, and length of haul.

The effect of these and other handicaps are clearly evident in the differences in the ton-mile expenses as shown in the statement given above. The high ton-mile expense does not mean low efficiency, but it does reflect some or all of the factors which have been mentioned. The operating ratios on these various lines operating under the various conditions depend largely upon whether the local rates on these railroads or the division of the through rates secured by these lines also reflect the relative operating and traffic handicaps. It may be claimed that the traffic department of such a line should see to it that the revenues do reflect such handicaps, but rates and divisions on one railroad are and always will be dependent to a considerable extent upon the conditions of a section of the country. This brings in the question of the strong and weak lines in the same territory. What this article is attempting to point out is that the weak line, the revenues of which do not properly reflect the operating handicaps, should not on this account be classed as an inefficient carrier. The operating ratio is valuable in the consideration of this line as an investing risk, but not as a measuring stick of the efficiency of its operating staff.

Net Operating Income

The same facts which have been discussed in connection with the operating ratio apply also in any discussion of the

net railway operating income. The importance of this figure is fundamental in that it measures the extent to which the railroads are approaching the statutory rate of return. It does not, however, reflect operating efficiency, for net railway operating income is affected by the earnings of the line to a greater extent than by the expenses. This is due particularly to the fixed nature of a large portion of railroad expense. In consideration of the net railway operating income from month to month, it must be constantly borne in mind that expenses will not fluctuate with revenues. Over short periods of time, the percentage of change in expense should be less than half the percentage of change in revenue. Over longer periods of time the percentage will be slightly higher than 50 per cent, but with conditions equal, the percentage will rarely be higher than 60 per cent.

Changes in the net railway operating income are frequently due to this fact. It will increase to a very material extent with a relatively small increase in revenues on account of the fact that the expenses do not increase in anything like the same degree. Likewise, the net railway operating income can be reduced to a very marked extent by a slight decline in revenue on account of the fact that it is impossible to reduce the expenses in the same ratio. The net railway operating income, therefore, is of little value as an index of efficiency, although it is of the greatest importance in the analysis of the general condition of a railroad.

All three of the principles which have been outlined appear in the consideration of this small monthly report of revenues and expenses. The fact that statistics are more frequently a measuring stick of handicaps than efficiency is illustrated in the operating ratio. The fallacy of using but one unit in measuring efficiency is shown by both the operating ratio and the transportation ratio. The importance of fixed expenses is shown in the analysis of the net railway operating income. One or more of these same principles enter into the consideration of the other operating statistics shown in the annual reports and in the monthly OS statements.

Accident Investigations— January, February and March*

THE FIFTEENTH quarterly issue of the summary of train accident investigations, prepared by the Bureau of Safety of the Interstate Commerce Commission, which is for the months of January, February and March, 1923, was issued on July 10. The report covers 24 collisions, 7 derailments and two other accidents, a total of 33. Below is a list of these accidents, the serial number in the first column being that shown in the records of the commission. The letter *c* indicates collision and *d*, derailment.

Twenty-one of the 33 are abstracted below; the collision at Alexis, Ohio, was reported in the *Railway Age* of April 28, page 1052; and 11 others, of comparatively less importance must be omitted for lack of space.

Abstracts of Reports

Chicago, Burlington & Quincy, Meadville, Mo., January 4.—Westbound freight train No. 83 collided with eastbound freight No. 72, third section; both locomotives fell down a bank and 10 cars were demolished. The engineman, fireman and one brakeman of No. 83 and the engineman of the eastbound train were killed, and four employees were injured. The westbound train met the second section of No. 72 at

*Government accident investigations for two years; quarterly reports abstracted in the *Railway Age*:

1921—No. 7	July 2, 1921, p. 35	1922—No. 11	June 17, 1922, p. 1483
No. 8	Sept. 3, 1921, p. 459	No. 12	Sept. 2, 1922, p. 426
No. 9	Dec. 10, 1921, p. 1145	No. 13	Dec. 30, 1922, p. 1239
No. 10	June 10, 1922, p. 1343	No. 14	Mar. 24, 1923, p. 815

Laclede and immediately after the passage of that train proceeded westward, regardless of the fact that the third section was due and was superior by direction. The conductor and the flagman of the westbound train acknowledged mistaking second 72 for third 72. All the men on the engine of No. 83 were killed. The report has nothing to say on the question why the conductor and the flagman should assume the second section was the third when they had not seen any other train which could be called the second section. On this line the manual block system is in use, but No. 83 had left Laclede on a clearance card which was issued before the block was actually clear; it is said that the block would be clear after the arrival of certain trains. This practice of issuing clearance cars to be acted upon at some later time was tolerated for the purpose of avoiding congestion in the yard; but the conductor, after having received the card, proceeded to the west end of the siding and was beyond the control of the station operator. The report calls attention to the desirability of installing signals at outlet switches.

Chicago, Rock Island & Pacific, Union, Mo., January 9.—Eastbound freight train No. 96, first section, standing at a coal and water station at about 1 a. m. was run into at the rear by No. 96, second section, moving at about four miles an hour. The caboose of the standing train was badly damaged, caught fire and was destroyed, and a drover riding in it was killed. Three other drovers were injured. This

caboose and several cars were wrecked and the rear brakeman of the leading train was killed. This collision occurred about 1 a. m., in fair weather; and the inspector finds that the engineman of No. 1024 failed to observe and obey automatic block signal indications. The engineman and fireman were working on the automatic stoker, which was causing them trouble, and were paying no attention to the safe operation of their train. The engineman asserted that the cautionary signal had displayed a clear indication, but the inspector thinks that this is not so. The report calls attention to the fact that an automatic train control system would have prevented the collision; and also says that the engine of 1024, which was moving backward, was being run at about 20 miles an hour whereas the rule requires speed in such a case to be limited to 15 miles an hour. It also appeared that the conductor had no knowledge of this speed-limit rule.

Louisville & Nashville, Nelsonville, Ky., January 11.—Northbound freight No. 52, second section, ran past an appointed meeting point and collided with southbound freight No. 55, first section. This collision occurred at about 12:07 a. m.; both trains were moving at about 25 miles an hour and 15 cars were wrecked. The fireman of the northbound train was killed. The engineman of the northbound train misread the train order fixing the meeting point and the front end brakeman forgot it; and the conductor and the flagman in the caboose admitted that they passed the station where they should have stopped without knowing they had passed it. The report calls attention to the need of the block system to provide against such inexcusable carelessness. It indicates that the engineman, the fireman and the brakeman read this and other meeting orders in the presence of each other and that some remarks were made concerning the contents of the orders; and yet that they were going through these operations in a perfunctory manner.

Seaboard Air Line, Hagood, Va., February 1.—Southbound passenger train No. 301, which had stopped (at 4:23 a. m.) to enter a side track to be passed by a following passenger train, No. 1, was run into at the rear by No. 1, moving at a speed of about 35 or 40 miles an hour. The boiler of the locomotive was torn from its frame and thrown to one side of the track while the frame and wheels were wedged under the wrecked business car at the rear of the leading train. The engineman was killed and five passengers and one employee were injured. The operator at La Crosse, four miles north of Hagood, who had been selling tickets for a northbound train and had other things on his mind, and was anxious to avoid delaying No. 1, overlooked the necessity of obtaining the block for No. 1. Also, the dispatcher had issued a clearance addressed to both No. 1 and 301, saying that the block would be clear from La Crosse on the arrival there of northbound passenger train No. 6. The conductor and the engineman of No. 1 were at fault for accepting this clearance, addressed to two trains, when of course the block could not be clear for both of them at once. No. 1 normally should have been ahead of 301 and an order had been issued requiring No. 1 to pass it at Hagood. The men in charge of No. 1 should have known that they were entering the block five minutes before No. 301 was scheduled to reach the farther end of the block and, therefore, that the clearance card had been improperly issued. The operator at fault had been in the service only one month but had had several years' experience on other railroads. Attention is called to the fact that if No. 301 had been protected by flag or fusee, the collision would, no doubt, have been averted. The operator had been off duty 16 hours, before going on duty at 11 p. m., but during that period had had only two or three hours' sleep.

Illinois Central, Chicago, Ill., February 4.—A northbound freight train which had just been brought to a stop, with its rear end near 48th street, was run into by a following express train, second No. 10, consisting of six refrig-

ACCIDENT INVESTIGATIONS COMPLETED IN FIRST QUARTER OF 1923

917 c	Chicago B. & O.	Meadville, Mo.	January 4	9
918 c	Chicago, R. I. & P.	Union, Mo.	" 9	9
919 c	Pere Marquette	McDonald, Mich.	" 11	11
920 c	Louisville & Nashville	Nelsonville, Ky.	" 11	11
921 c	Pere Marquette	Alexis, Ohio	" 13	13
922 d	Texas & New Orleans	Kaufman, Tex.	" 16	16
923 c	Kansas City Southern	Grand View, Mo.	" 23	23
924 c	St. L. S. F.	Neelys, Mo.	" 25	25
925 c	C. R. I. & P.	Pratt, Kans.	" 26	26
926 c	Seaboard Air Line	Hagood, Va.	February 1	1
927 c	Illinois Central	Chicago, Ill.	" 4	4
928 c	Baltimore & Ohio	Lester, O.	" 5	5
929 d	Cleveland, C. C. & St. L.	St. Mary-of-the-Woods, Ind.	" 6	6
930 c	Chicago & Alton	Nilwood, Ill.	" 12	12
931 c	New York Central	Albany, N. Y.	" 13	13
932 c	Baltimore & Ohio	Freeport, O.	" 19	19
933 c	Lehigh Valley	Rummerfeld, Pa.	" 20	20
934 c	D. L. & W.	Gravel Place, Pa.	" 20	20
935 c	Norfolk Southern	Hertford, N. C.	" 25	25
936 d	Nashville, C. & St. L.	Calhoun, Ga.	" 26	26
937 c	St. L. S. F.	Pratt City, Ala.	" 26	26
938 c	Pennsylvania	Logansport, Ind.	" 26	26
939 c	A. T. & S. F.	Frantenc, Kans.	" 27	27
940 d	Indiana Harbor Belt	Burnham, Ill.	March 1	1
941 c	Louisville & Nashville	Goulding, Fla.	" 9	9
942 d	Illinois Central	Corinth, Miss.	" 17	17
943 c	Atlantic Coast Line	Palmyra, N. C.	" 18	18
944 c	New York, O. & W.	Maywood, N. Y.	" 24	24
945 d	Chicago, M. & St. P.	Poyette, Wis.	" 26	26
946 c	Grand Trunk	Island Pond, Vt.	" 28	28
947 c	Illinois Cen. & Gt. No.	Hills, Minn.	" 28	28
948 c	Cleveland, C. C. & St. L.	Columbus, O.	" 30	30
949 d	Spokane, Port. & Seattle	South Cheney, Wash.	" 31	31

collision occurred within yard limits where freight trains may occupy the main track, under certain conditions, without flagging; but trains carrying passengers "must be protected at all times." The conductor in this case claims that he did not consider the drovers as passengers, and as there was a sufficient view from the rear, he sent out no flag. No member of the crew was at the rear of the train at the time of the collision. The inspector lays the blame on the conductor and the flagman of the first section, but also censures the fireman and a brakeman on the second section for not properly observing conditions ahead; they might have seen the light of No. 96 soon enough to enable the engineman to stop. There was no block system on this line. The inspector deems fixed signals especially necessary at this place because it is a coal and water station approached on a line of descending grade and numerous curves.

Pere Marquette, McDonald, Mich., January 11.—Southbound extra freight train 1015, consisting of a locomotive, 66 cars and a caboose, moving at about 10 or 15 miles an hour, was run into at the rear by southbound freight extra 1024, consisting of a locomotive, 13 cars and a caboose. The

erators and five empty sleeping cars; and the conductor of the freight, who was in the caboose, was killed; two other employees were injured. This collision, which occurred about 1:23 p. m. was on that portion of the line where there are eight main tracks, and these trains were on track No. 4, the northbound through passenger track. After discussing the circumstances at great length, the inspector concludes that the express had disregarded an automatic block signal set against it. This was a color light signal, No. 4-62. It is about 1,600 ft. south of the point of collision. It is on a bracket post just east of track No. 4 at 51st street. On this portion of the road, in clear weather, flagmen are required to go back only about 60 ft.; and, because of a city ordinance, whistle signals are not given to flagmen, either to go out or to come in. The inspector observes that an automatic train stop would have prevented this collision. The fireman had a clear record, but the engineman had been disciplined on several occasions for responsibility in connection with collisions and for other infractions of rules.

Cleveland, Cincinnati, Chicago & St. Louis, St. Mary-of-the-Woods, Ind., February 6.—Eastbound passenger No. 46, moving at full speed, was derailed at a switch which had been maliciously loosened, and the engine and first two cars fell down a bank and were wrecked. The fireman was killed and five passengers, five mail clerks and one employee were injured. This collision occurred about 2:40 a. m. The switch light had been extinguished and a telephone booth nearby had been tampered with. There was a distant signal indicating caution, and the engineman is held at fault for not reducing speed; his excuse was that he could see the switch target, by the light of the headlight, both engineman and fireman calling it a clear indication; but the absence of a light indication at the switch also should have led the runner to apply the brakes.

Chicago & Alton, Nilwood, Ill., February 12.—In a dense fog, about midnight, northbound passenger train No. 6, moving at high speed, ran into the rear of a northbound freight which was moving at about 20 miles an hour; and the engineman and fireman were killed. The passenger engine was overturned and several cars in both trains were badly damaged. The inspector holds that the engineman of the passenger train had run past two automatic signals set against him. It appeared from the condition of the engines in the wreck that he had not shut off steam or applied the brakes. The freight was perhaps justified in running on the time of the passenger, because to set off it would have been necessary to use the southbound main track, on which a passenger train was due; but in such case great care should have been exercised to signal the passenger train; and this was not done. The flagman had thrown off some fuses but had not used enough of them. He was an experienced man, fully acquainted with the conditions. The inspector holds that the conductor should have left the flagman at Carlinville to stop No. 6. In cases of this character, says the report, where the road is properly signaled and the trainmen are experienced, failures of the human element cannot be fully provided against except by the use of automatic train control.

New York Central, Albany, N. Y., February 13.—A freight train of 51 cars, moving from West Albany to East Albany, became uncontrollable on a steep descending grade and collided with a light engine, driving it against another freight standing ahead of it; and two locomotives and three cars were badly damaged. Two employees were injured. The engineman in charge of the runaway train is held to have been not properly qualified to operate the air brake system; he thought that when the brake valve was placed in the holding position both engine and train brakes were held applied; and in making service applications on the grade after leaving West Albany, he moved his brake valve from service to holding position instead of to lap position; and he is held responsible for the collision.

Baltimore & Ohio, Freeport, Ohio, February 19.—Westbound freight train No. 73, having only 12 cars, ran into the rear of westbound freight No. 83, first section, which had been stopped on bridge No. 9 because of brake pipe leakage; and the engineman and one brakeman of No. 73 were killed. The fault is placed on the engineman of No. 73, who did not observe and obey the signals of the flagman of the standing train. Warning had been given also by torpedoes not far back, and by a fusee. It is estimated that the fusee had been burning about two minutes when it was passed by No. 73. The distances and the time intervals were so short that it was found impossible to decide whether or not the flagman could have gone farther back. The manual block is in use, but only for the protection of the rear of passenger trains.

Lehigh Valley, Rummerfield, Pa., February 20, 6:45 a. m.—Westbound express train No. 17, consisting of 16 mail and express cars, moving at from 25 to 45 miles an hour, ran into two light engines and a caboose, standing at a water tank. The engineman, fireman and one other man on the express locomotive and three employees in the caboose of the standing train were killed. Summarizing a long account of the circumstances, the inspector puts the blame on the engineman of No. 17 for not properly observing automatic signal indications, and on the flagman of the standing train for not properly protecting his train. There was conflicting evidence as to whether the flagman's stop signals were acknowledged, but the brakes of No. 17 were not applied until the engine was within a very short distance of the standing caboose, though there was a good view. The flagman had 10 minutes in which to go back but had gone only about 1,000 ft.; and he took no torpedoes with him. He gave the stop signal with his white lantern instead of the red one.

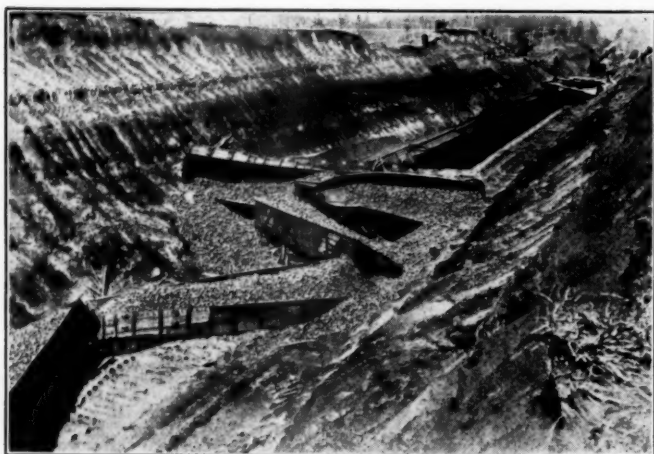
Nashville, Chattanooga & St. Louis, Calhoun, Ga., February 26.—Northbound passenger train No. 94, second section, moving at about 45 miles an hour, was derailed at a point where the track was weak because of insufficient ballast; one of the two locomotives was overturned and two of the eight derailed cars were overturned. One passenger and the fireman of the second locomotive were killed and 25 passengers and nine employees were injured. Trackmen had been raising the track and for considerable stretches the ballast did not properly support the ties; the ballast was foul with slime because of poor drainage, and new creosoted ties were wet and very slippery because of the heavy rain; and the inspector believes that the track was pushed sidewise by the weight of the two locomotives moving at high speed. The left rail was overturned. Responsibility is placed upon the track foreman; but supervising officers in the track department are held to be open to censure for failing to see that proper warning signals had not been displayed to limit the speed of trains.

St. Louis-San Francisco, Pratt City, Alabama, February 26.—A freight train, moving at very low speed, broke in two because of a worn and defective coupler on the locomotive; and because of the sudden stop thus caused, the caboose at the rear of the train was crushed by the locomotive pushing it; and three employees, riding on its front platform, were killed. The train consisted of about 60 cars but the air brakes were coupled on only about 15 cars near the front end, thus allowing the violent closing up of the slack; and this was the principal cause of the crushing of the caboose. The locomotive drawing the train was moving backward and the defective coupler was at its pilot end; and this coupler was found to have too much vertical play; also, the lower part of it was worn beyond the prescribed limits. The train was moving over the main line for only a short distance and it appeared that the statutory requirement of 85 per cent power brakes in use had been habitually disobeyed in movements of this kind.

Pennsylvania, Logansport, Ind., February 26.—Collision

between a locomotive unattended, moving westward, and a double headed freight, moving eastward, causing the death of one of the enginemen of the eastbound train, which was moving at about seven miles an hour. The wild engine, traveling about 30 miles an hour, had become uncontrollable because of the breaking of the throttle lever fulcrum which made it impossible for the hostler in charge to shut off steam. The inspector investigated the history of this fulcrum arm but could not ascertain when or under what circumstances it was made. The locomotive was built about 20 years ago, but the arm had been lengthened or repaired in the smithshop and it is believed that the rupture was started at that time.

Illinois Central, Corinth, Miss., March 17.—A northbound freight train was derailed by a landslide in a cut about midnight, while moving at 25 or 30 miles an hour, and the engineman and fireman were killed. The front portion of the train, 17 cars, was piled up crossways on the track, and farther back in the train nine other cars were similarly



Derailed Near Corinth, Miss.

piled up. This cut, about 45 ft. deep and 126 ft. wide at the top, had never caused trouble before, and no fault appears to have been found with the drainage; but it is believed that a stratum of blue clay had been forced down against the ties, and the track appears to have been lifted as much as 16 inches. A brakeman riding in the locomotive survived; he said that the electric headlight shone brightly but that he was looking for a switch light, a little distance ahead, and did not see anything wrong in the track.

New York, Ontario & Western, Maywood, N. Y., March 24.—Southbound passenger train No. 56, moving at good speed, collided with a northbound freight standing near the station; and a trainman of the freight, who was connecting the air hose between two cars, was killed; 37 passengers, 1 mail clerk and 6 employees were injured. The men in charge of the passenger train had forgotten a meeting order and the train also had passed an automatic block signal set against it. Both conductor and engineman admitted forgetting the train order and both had neglected to properly impart the contents of the train order to their subordinates. The baggageman did know the contents of the order but he was not alert. He might have applied the brakes when he saw that the meeting point was being passed. The conductor had neglected to give the warning air signal to the engineman approaching the meeting point. The conductor and the engineman were both men of long experience with fair records. The conductor in explaining his failure to stop the train said that he could not reach the air signal without standing on a seat, and the seats were all occupied.

Chicago, Milwaukee & St. Paul, Poynette, Wis., March 26.—Eastbound passenger train No. 516, consisting of one

express car and two coaches, was wrecked by falling into a stream because of the destruction of a pile bridge by fire; engineman, fireman and baggage man killed and 12 passengers, one express messenger and one employee injured. This derailment occurred at 7:55 a. m., on Monday, and the only theory as to the cause of the fire is that sparks fell from the locomotive of a freight train which passed over the line on the afternoon of Sunday, the last train over the road. The grates of the locomotive of the freight had been shaken considerably along this part of the road, the grade being ascending and the coal being of poor quality. A high wind prevailed on Sunday. The bridge is not in sight of any highway or dwelling and the track foreman had not been over the road since Saturday. The bridge, 48 ft. long, made of cedar piling and fir timbers, was entirely destroyed. Its deck was covered with galvanized sheet iron, but in order to allow the use of a track circuit for the operation of a highway crossing bell, a 4-in. strip of the sheet iron had been cut out along the inside of the south rail, for the entire length of the bridge.

Hills, Minn.; crossing of Illinois Central and Great Northern. On March 28, in broad daylight, a westbound passenger train of the Illinois Central and a southbound passenger train of the Great Northern came together at the crossing of the two roads and one of the locomotives was knocked down a bank. The fireman of the Illinois Central was killed and one other employee was injured. There are no interlocking signals at this crossing. Trains on both roads are required to stop. Both of these trains had stopped at the station some considerable distance back. Both were moving at low speed, probably less than 10 miles an hour, and the inspector is unable to decide which train ran into the other, the evidence concerning this and many details being conflicting. He concludes with the statement that the crews of both engines neglected to take proper precautions for the safe movement of their respective trains over the crossing. The Illinois Central train had been moving at about 15 miles an hour and the engineman did not apply brakes until within 75 ft. of the crossing; while on the Great Northern train, the engineman put on steam, when quite near the crossing, though well aware that the fireman, who should have kept a lookout on the left hand side, was not so doing, but was putting in coal. There is no evidence that either train had the right of way over the other. The inspector believes that the traffic at this crossing is so light that the installation of interlocking signals would not be warranted; but ample protection could be afforded by the use of a crossing gate. One of these enginemen had been running for 27 years and the other for 32 years.

Cleveland, Cincinnati, Chicago & St. Louis, Columbus, Ohio, March 30.—Southbound passenger train No. 11, consisting of a heavy locomotive and eight cars, moving at about 70 miles an hour, struck an automobile at a highway crossing and was wrecked. One passenger, three persons in the automobile, three employees and one trespasser were killed and 43 passengers and five employees were injured. The driver of the automobile, a woman, residing not far away, well acquainted with the location, and a competent driver, appears to have driven on to the track without looking in the direction of the approaching train. She had with her two children; the side curtains of the car were down; the view of the train was cut off by buildings approaching the crossing but it was visible before the buildings were reached and there was a space of about 40 ft., after passing the buildings, in which the train could be seen. The inspector finds that this crossing is a busy one. An average of 800 people daily cross the tracks, and as there are two railroads at this point, it is believed that there should be some form of protection in addition to that afforded by the crossing signs. If the passenger cars in this train had been of wood, there would undoubtedly have been great loss of life.

Soo's Five Months' Earnings Promise Well

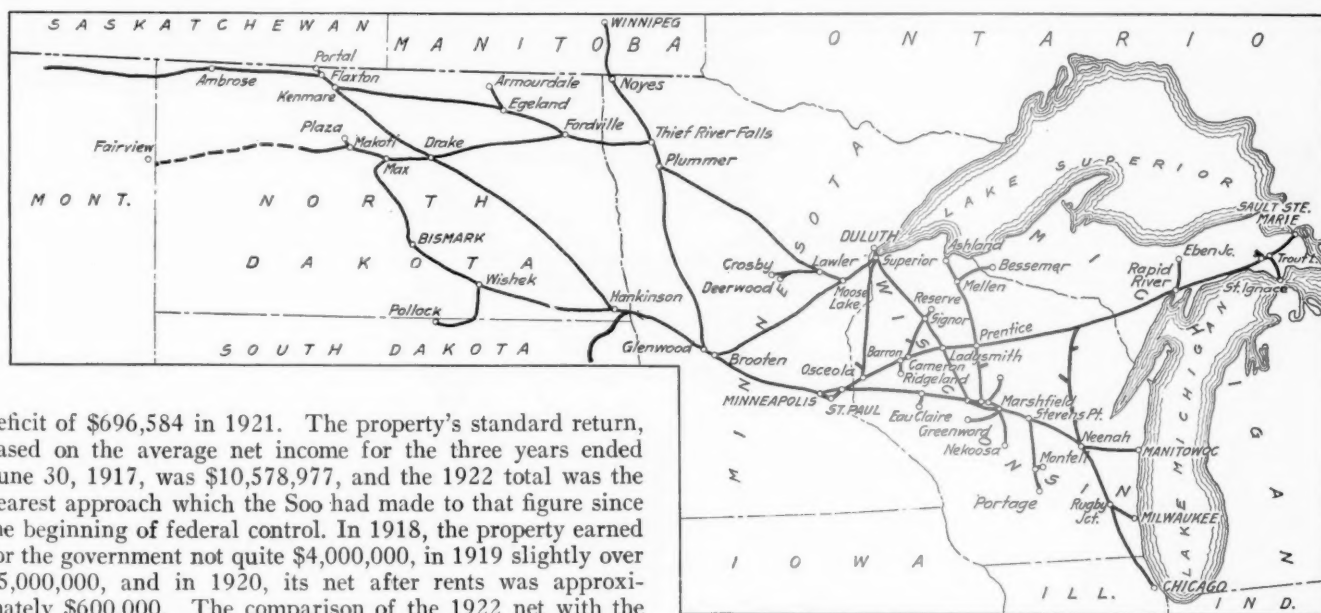
Property Has Not Shown Good Earnings Since Beginning of Federal Control—1922 Best Year in Last Five

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has not in recent years been evidencing the strong earning power which was its leading characteristic prior to the war and the period of federal control. This failure to earn net income in pre-war amount is a feature that the several properties in the Northwest have in common. The fact that the reductions in rates on agricultural products have been greater and were made earlier than on other commodities is a fact of leading importance, particularly as concerns 1922 results.

The Soo, in 1922, had a surplus after fixed charges of about \$499,046 which compared with a deficit after charges in 1921 of \$3,472,158. Prior to the war it was a poor year in which the Soo did not have a net after charges of at least \$2,500,000. In 1916, as was also the case in 1913, its net was over \$5,000,000. Even with this situation, however, there is evidence that the condition of the Soo is gradually beginning to show some improvement. In 1922, for example, the property, inclusive of the Wisconsin Central, had a net operating income of \$7,178,971, which was the best net after rents it had had since 1917. The figure compared with a

majority stock-controlled Wisconsin Central. These figures add up to more than the 4,381 given as the total for the system because each line uses trackage rights over portions of the other. The lines of the parent company extend from Sault Ste. Marie west through the twin cities and thence northward to the Canadian border at Noyes on the way to Winnipeg; to the Canadian border also at Portal where a connection is made with the Canadian Pacific. There is also a line to Duluth and various branch lines in Minnesota, North Dakota and including an extension into Montana. The Wisconsin Central gives the Soo its entrance into Chicago and in addition the Wisconsin Central lines extend to Ashland and Duluth on Lake Superior.

The Minneapolis, St. Paul & Sault Ste. Marie is controlled by the Canadian Pacific through the ownership of a majority of both the common and preferred stock, and the Canadian Pacific, in addition, guarantees the interest on practically all of the Soo Line outstanding bond issues. The Soo Line's control, in turn, of the Wisconsin Central is in the form of a 99 year lease, and in addition, the ownership of about 51 per cent of the common stock and all of the Wis-



The Minneapolis, St. Paul & Sault Ste. Marie

deficit of \$696,584 in 1921. The property's standard return, based on the average net income for the three years ended June 30, 1917, was \$10,578,977, and the 1922 total was the nearest approach which the Soo had made to that figure since the beginning of federal control. In 1918, the property earned for the government not quite \$4,000,000, in 1919 slightly over \$5,000,000, and in 1920, its net after rents was approximately \$600,000. The comparison of the 1922 net with the figures for the years immediately preceding 1922 is encouraging, except, of course, for the thought that the 1922 figure was still much below the standard return level. The year 1923 will probably be better for the Soo than 1922 was because there will likely be a better ore movement, a greater demand for lumber and forest products generally, and as now appears likely, a better car supply for grain. If the 1923 business continues as good as it now looks as if it would the Soo may reach its pre-war standard. The possibility that it will look good. At least the year is starting well because earnings for the first five months—the Soo makes the most of its year's net in the latter part of the year—showed a net after rents of \$1,995,466, as compared with the deficit for the first five months of 1922 of \$332,453.

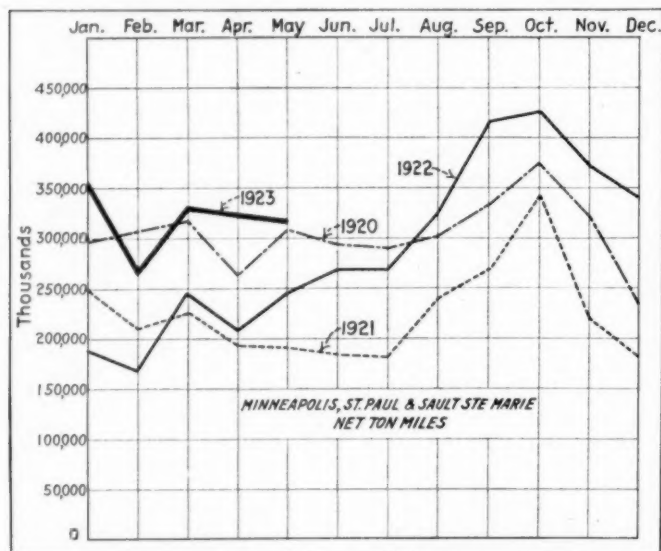
The Minneapolis, St. Paul & Sault Ste. Marie system operates a total of 4,381 miles of which 3,322 miles is contained in the parent company, and 1,133 in the leased and

consin Central preferred, for which latter issue the Soo Line issued leased line stock certificates. The Wisconsin Central preferred is held in trust and the Soo is obligated to pay 4 per cent on the certificates. The Wisconsin Central is operated as the Chicago division of the Soo. In the Soo annual returns the earnings for the two lines are shown separately. They are combined, however, in the monthly reports to the I. C. C.

Grain, lumber, iron ore and live stock and dairy products make up the four most important groups of commodities handled by the system. The most important grain carried is wheat. The grain is secured over a large part of the Soo territory and moves to the mills at Minneapolis or to the lake at Duluth. The volume of lumber and forest products seems in recent years to have held up fairly well in spite of the fact that a large share of the Soo territory is in the form of cut-

over lands, which are being brought into use agriculturally. Dairy products and live stock are of growing importance in Soo Line calculations, and Wisconsin in particular is becoming one of the country's leading producers of these commodities. The Soo Line has a large business in iron ore, and as is characteristic of this traffic, it is subject to wide variations from year to year and has a disproportionate effect on net income, the Soo net being increased markedly in the years when the ore traffic is good, and being correspondingly poor when the ore traffic is bad. The two ore ports served by the Soo are Superior and Ashland, the docks at Superior receiving ore originating approximately 90 miles distant on the Cuyuna range, and the ore from Ashland originating on the Gogebic range from which there is an average haul of about 58 miles. The iron ore traffic in 1922 was fair. For the Soo and Wisconsin Central combined it totaled 2,750,141 tons, divided about evenly between the two ranges. The variation in the traffic is indicated by the fact that in 1921 the total ore tonnage was only 569,869. The best year as far as iron ore is concerned in the Soo history was in 1918 when the total ore tonnage totaled 3,527,694. In 1920, the next best year, it was 3,299,677.

The Soo's physical standards are indicated, in part, in the statement that its main lines are laid with 85-lb. rail, although installation of some 90-lb. steel is planned for the current year. Gravel ballast is used. The road is not equipped with automatic block signals. The fact that the figures for the Soo and the Wisconsin Central are shown separately in the annual report, permits of some interesting comparisons as between the two lines. It develops, for example, that the traffic density of the Soo itself in 1922 was

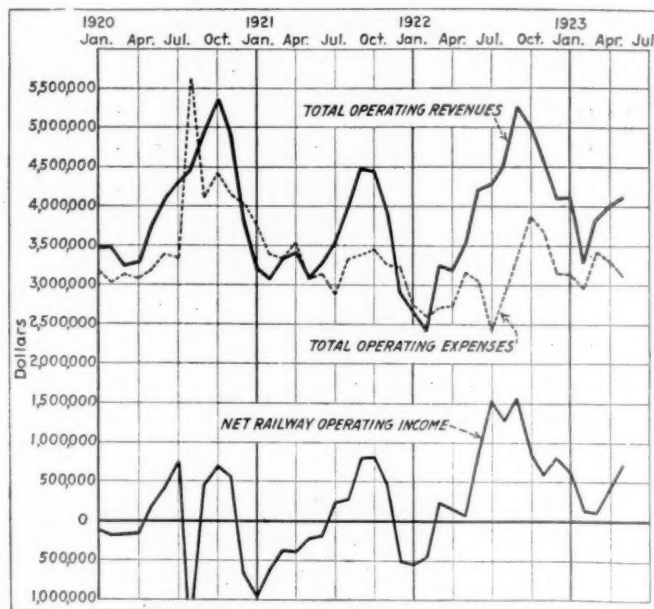


Soo Net Ton Miles Have Been Ahead of 1920 Figures Since Last August

543,176 ton miles per mile of road, whereas, on the Wisconsin Central the density was 1,157,987. Earnings per ton per mile of 1.180 cents on the Soo and an average haul of 215, compared respectively with ton mile earnings of 1.086 cents on the Wisconsin Central and an average haul of 180 miles. The Soo net operating revenue per mile of road was \$1,951 and that for the Wisconsin Central, \$3,694. The parent company's revenue tons per train and per car were 446 and 21 respectively, whereas the Wisconsin Central figures were 541 and 23.

In 1922, the gross income of the combined companies was \$47,107,105 as compared with \$42,745,440 in 1921. The freight revenues of 35,529,521 represented an increase over 1921 of 4,439,146, or 14 per cent. The increase of 14 per cent accompanied an increase in revenue ton miles of 28 per

cent, it being estimated that the rate reductions caused a decrease of revenue of approximately \$3,141,000. The 1922 operating expenses were \$36,442,851 as compared with \$39,755,399 in 1921. It is of special interest that in spite of the increase in tons per mile of 28 per cent, the transportation expenses were increased only 0.3 per cent. The essential reason for the decrease in expenses in 1922 as compared with 1921 was a reduction in maintenance of equipment expenses of \$2,593,827 due to the reduction in work carried on during the strike of the shop forces, and resulting also because there were abnormal charges to maintenance of equipment in 1921. The Soo, at the present time, has a fairly good equipment



Soo Gross and Net to May

condition. Its bad order cars, as of June 15, amount to 8.4 per cent, and its locomotives held for repairs requiring over 24 hours, to 17.1 per cent, with 9 locomotives stored serviceable.

The Soo has had some difficulty recently with reference to its dividend payments. From 1910 to 1921 it paid 7 per cent on both its common and preferred stock, but in March, 1922, semi-annual dividends of 2 per cent were declared on both issues, these dividends being paid out of accumulated surplus earnings of previous years, there having been no surplus earnings in 1921. This situation is now before the courts, the preferred stockholders having claimed that they are entitled to 7 per cent before any disbursements are made on the common, but the directors having felt, on the other hand, that inasmuch as the disbursements were met out of earnings in years prior to 1921, the 4 per cent rate was proper. They made this decision to declare equal dividends on both classes of stock because the company's articles of consolidation—the following is quoted from the annual report—"provide that after preferred and common stock have received 7 per cent each from the earnings of any year, as they had received from the earnings of 1909 to 1919, and further, dividends from the earnings of any such year shall be equal on the two classes of stock, share for share."

THE FREIGHT CLAIM DIVISION of the American Railway Association reports that the damage claims paid on sewer pipe and clay products were 10 per cent more for the first quarter of 1923 than for the first quarter of 1922, and at this rate they will approximate \$1,000,000 a year. The association also reports that egg claims have been reduced from \$1,250,000 in 1920 to a current rate of \$400,000 in 1923.

Bad Order Cars Down to 8.4 Per Cent

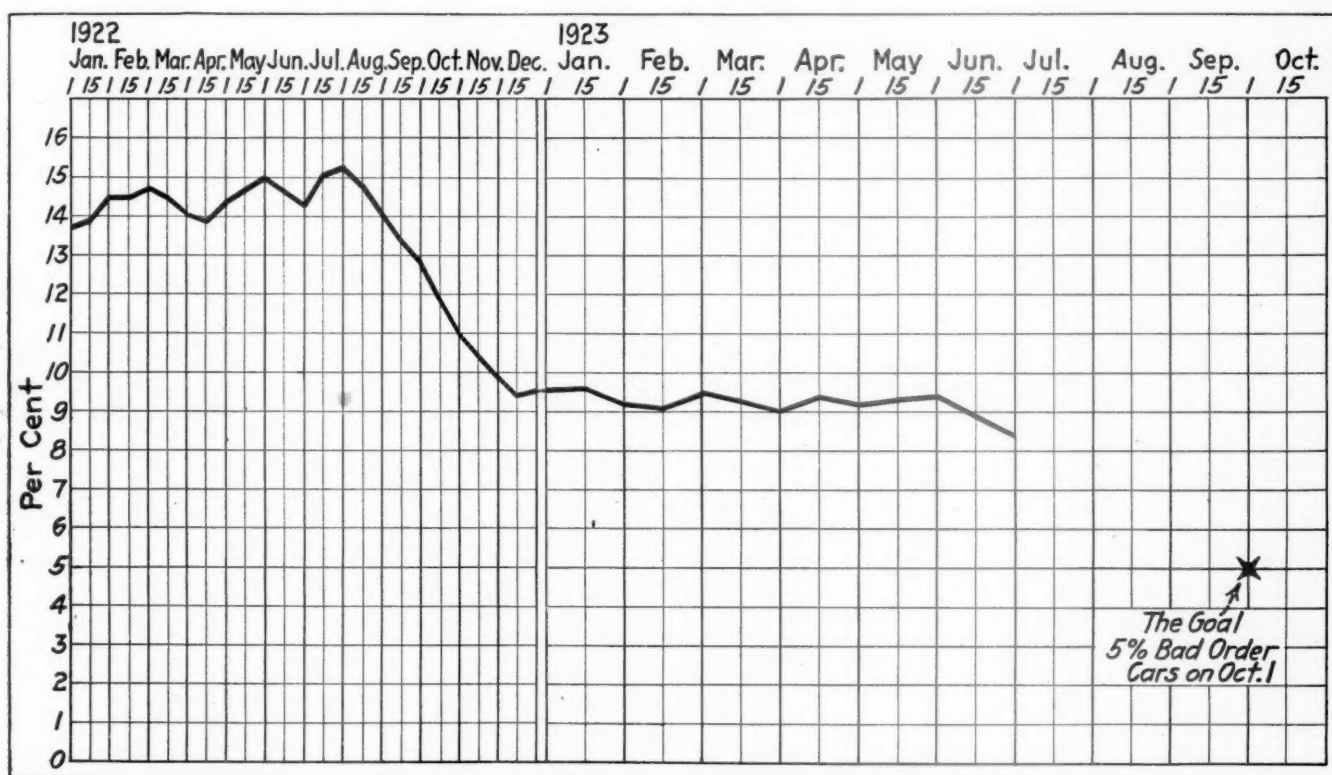
UNDER THE PROGRAM formulated by the American Railway Association the railways aim by October 1, to reduce their bad order cars to 5 per cent and their locomotives held for repairs requiring over 24 hours to 15 per cent.

The latest figures at present available, those for July 1, indicate satisfactory progress towards these goals and accordingly substantial improvement in the equipment repair situation. As of July 1, the bad order cars have been brought down to 8.4 per cent. On June 15, the figure reported was 8.9 per cent and June 15 was the first date since February, 1921, at which the bad orders have been below 9 per cent. Throughout much of 1921, the percentage was in the neighborhood of 15, the bad order peak as expressed in either actual numbers or percentage being reached on August 15, when

Marquette with 4.4, the Southern Pacific System with 4.6, the Illinois Central with 4.8, etc.

The real honors, however, go to the Steel Corporation roads in the ore districts. In a tabulation for the figures for the roads of sufficient size to own 100 or more locomotives, with the roads arranged in the order of excellence from the viewpoint of their low bad order car percentage, it develops that of the first three roads one is the Duluth, Missabe & Northern with a bad order car percentage as of July 1 of but 1.6 per cent and another the Duluth & Iron Range with but 2.6 per cent. Two per cent is the figure reported by the Long Island; the Western Pacific reports 3 and the Virginian 3.2.

The list which follows shows the roads arranged by their bad order car percentages, the road with the lowest percentage first, that with the next lowest second, etc., down to the road with the highest percentage last. The roads included are those owning over 100 locomotives, this being taken as a handy index. So that the relative size of the roads may be readily apparent, the figure is given of cars on line and in-



Progress Towards the Five Per Cent

the number was 382,440 and the percentage 16.6. The poorest report in 1922 was on August 1, when 345,013 bad orders produced a percentage of 15.3. Improvement starting at that time has been sufficient so that at no time since last November has the bad order percentage exceeded 10, although it was not until June 15, that it was brought below 9.

Analysis of the detailed figures compiled by the Car Service Division shows that a substantial number of roads had on July 1 already reached the desired goal of only 5 per cent bad order cars set by the A.R.A. for October 1. A number of roads have even reduced their percentage to 4 or below, among them being such important carriers as the Baltimore & Ohio which on July 1 had only 3.3 per cent of its cars in bad order, the Pennsylvania System with but 3.5 per cent, the Wabash with but 3.6 and the Lackawanna with an even 4. Among the other large roads which are below the desired 5 are also the Reading with 4.3 per cent, the Pere

asmuch as the relationship of heavy and light bad orders is important to secure an adequate picture, the total bad orders are separated under the heads of cars awaiting heavy and light repairs.

The figures follow:

Some Roads Report 4 Per Cent or Less

Road	Total cars on line	July 1, Cars awaiting repairs			Per cent to total on line
		Heavy	Light	Total	
Duluth, Missabe & Northern.....	9,295	87	65	152	1.6
Long Island	6,722	104	29	133	2.0
Duluth & Iron Range.....	6,502	19	152	171	2.6
Western Pacific	4,260	102	24	126	3.0
Virginian	8,255	186	77	263	3.2
Baltimore & Ohio.....	95,215	2,413	695	3,108	3.3
Pennsylvania System.....	258,809	7,426	1,600	9,026	3.5
*Wabash	19,338	604	90	694	3.6
Boston & Albany.....	8,421	185	123	308	3.7
Delaware, Lackawanna & Western.	24,118	345	625	970	4.0
Union	8,793	167	184	351	4.0

These Also Have Reached the Desired 5 Per Cent

Philadelphia & Reading.....	38,840	1,537	144	1,681	4.3
*Pere Marquette.....	23,827	692	363	1,055	4.4
Central of Georgia.....	7,527	311	29	340	4.5
Southern Pacific System.....	56,370	1,879	696	2,575	4.6
Illinois Central.....	60,531	1,245	1,618	2,863	4.7
Wheeling & Lake Erie.....	11,033	346	180	526	4.8

5 to 6 Per Cent

Lehigh Valley.....	34,733	1,658	152	1,810	5.2
Great Northern.....	54,879	1,630	1,362	2,992	5.5
Cleve., Cincin., Chic., & St. Louis.....	33,349	1,275	570	1,845	5.5
Colorado & Southern.....	5,259	207	83	290	5.5
Atlantic Coast Line.....	28,093	1,215	355	1,570	5.6
Norfolk & Western.....	40,386	1,448	852	2,300	5.7
El Paso & Southwestern.....	3,317	87	103	190	5.7
Gulf Coast Lines.....	3,045	140	37	177	5.8
New York, Ontario & Western.....	5,976	283	74	357	6.0

Below Country's Average of 8.4 Per Cent on July 1

Kansas City Southern.....	4,793	267	23	290	6.1
Atchison, Topeka & Santa Fe.....	69,156	3,241	1,481	4,722	6.8
Chesapeake & Ohio.....	44,465	2,334	731	3,065	6.9
Maine Central.....	7,460	164	354	518	6.9
Southern Railway.....	76,335	4,968	391	5,359	7.0
*Grand Trunk Western.....	14,137	699	301	1,000	7.1
Chicago & Northwestern.....	70,955	2,637	2,814	5,451	7.7
St. Louis-San Francisco.....	32,959	1,693	875	2,568	7.8
Chicago, Milwaukee & St. Paul.....	68,370	4,852	702	5,554	8.1
Union Pacific.....	51,781	2,251	1,918	4,169	8.1
Chicago Great Western.....	8,606	619	79	698	8.1
Chicago, Burlington & Quincy.....	67,046	4,215	1,328	5,543	8.3
Elgin, Joliet & Eastern.....	15,515	811	498	1,309	8.4

8.5 to 10 Per Cent

Northern Pacific.....	41,061	2,769	943	3,712	9.0
Minn., St. Paul & St. Ste. Marie.....	24,822	1,584	675	2,259	9.1
Delaware & Hudson.....	17,234	1,080	482	1,562	9.1
Denver & Rio Grande Western.....	11,113	771	250	1,021	9.2
Michigan Central.....	26,618	1,381	1,126	2,507	9.4
Florida East Coast.....	2,864	237	38	275	9.6
New York Central.....	137,632	8,976	4,341	13,317	9.7
Missouri Pacific.....	43,069	3,037	1,237	4,274	9.9
Buffalo, Rochester & Pittsburgh.....	11,447	811	320	1,131	9.9

Below 15 Per Cent

Missouri-Kansas-Texas.....	18,994	1,648	262	1,910	10.1
Chicago & Alton.....	12,756	1,088	233	1,321	10.4
Erie.....	50,379	4,590	868	5,458	10.8
Boston & Maine.....	32,416	2,893	614	3,507	10.8
New York, Chicago & St. Louis.....	9,148	762	254	1,016	11.1
Nash., Chattanooga & St. Louis.....	7,447	538	293	831	11.2
Central of New Jersey.....	25,436	2,687	372	3,059	12.0
Texas & Pacific.....	8,236	900	108	1,008	12.2
Lake Erie & Western.....	4,596	503	64	567	12.3
Chic., St. Paul, Minn. & Omaha.....	10,674	707	638	1,345	12.6
Chicago, Rock Island & Pacific.....	52,235	4,363	2,299	6,662	12.8
Fort Worth & Denver City.....	2,786	314	44	358	12.8
Pittsburgh & Lake Erie.....	19,667	2,252	646	2,898	14.7
International-Great Northern.....	4,506	660	7	667	14.8

Above 15 Per Cent

St. Louis Southwestern.....	9,266	1,284	176	1,460	15.8
Chicago, Ind. & Louisville.....	7,871	1,199	65	1,264	16.1
Chic., Terre Haute & So. Eastern.....	7,338	1,123	106	1,229	16.7
Louisville & Nashville.....	50,684	7,586	1,092	8,678	17.1
Mobile & Ohio.....	7,934	1,133	233	1,366	17.2
Minneapolis & St. Louis.....	8,315	1,246	259	1,505	18.1
Chicago & Eastern Ill.....	16,852	2,825	437	3,262	19.4
Western Maryland.....	11,649	2,162	117	2,279	19.6
Norfolk Southern.....	4,254	627	208	835	19.6
Central Vermont.....	3,124	580	31	611	19.6
New York, New Haven & Hartford.....	43,385	7,970	655	8,625	19.9
Bessemer & Lake Erie.....	9,440	1,747	209	1,956	20.7
*Seaboard Air Line.....	19,396	4,381	132	4,513	23.3
Hocking Valley.....	14,350	3,751	501	4,252	29.6

*Previous report.

Unserviceable Locomotives 18 Per Cent

The railroads of the United States had on July 1, the largest number of serviceable locomotives and the smallest number in need of repair for any time since the compilation by the Car Service Division of such reports began in August, 1920.

Serviceable locomotives on July 1, totaled 52,456. This was an increase of 1,237 over the number of serviceable locomotives on June 15.

At the same time the railroads had 11,450 locomotives in need of repair or 18 per cent of the total number on line. This was a decrease of 1,209 in the number of locomotives in need of repair since June 15, at which time there were 12,659 or 19.9 per cent. Locomotives in need of heavy repair totaled 10,326 or 16.2 per cent of the number on line, which was a decrease of 1,147 compared with the number in need of

such repair on June 15. Under the program adopted last April by the carriers, locomotives awaiting heavy repair are to be reduced to 15 per cent by October 1.

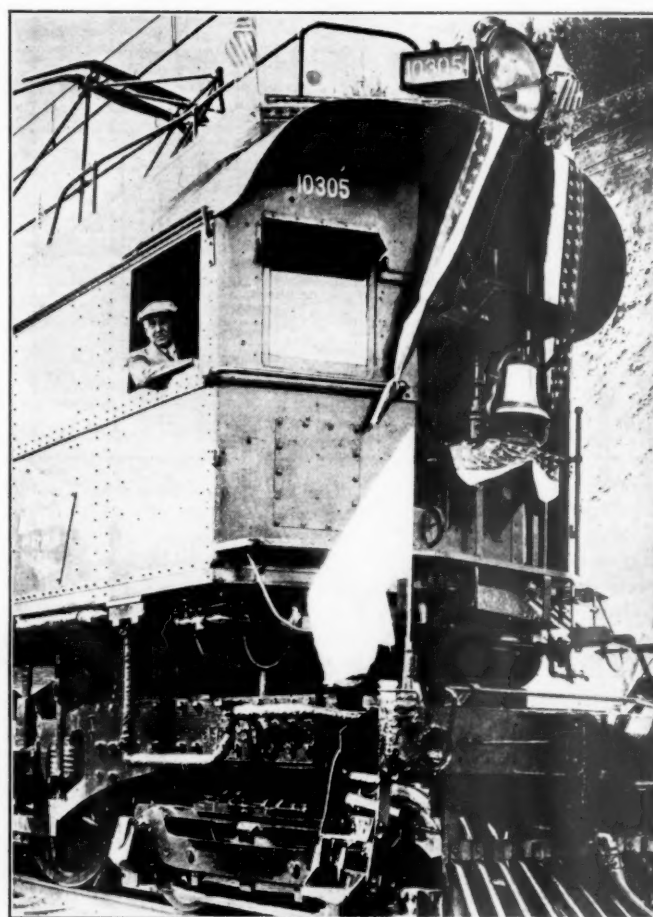
Reports also showed that 1,124 or 1.8 per cent of the number on line in need of light repair, a decrease of 62 since June 15.

The railroads of this country also had stored on July 1, 2,181 serviceable locomotives in good repair which are now being held in readiness for increased traffic demands. From June 15 to July 1, a total of 20,602 locomotives were repaired and turned out of the shops, which was an increase of 1,665 over the number repaired during the first 15 days in June.

New Cars in Service

A total of 8,646 new freight cars were placed in service by the railroads of the country between June 15 and July 1, according to reports just filed with the American Railway Association.

This brings the total number of new freight cars added to the transportation equipment of the carriers since the first of the year to 79,240. The roads also placed in service during the second half of June, 158 locomotives, making the total for the year to date 1,998. On July 1, the report shows, the railroads had 96,855 freight cars still on order, and 1,902 locomotives. Of the freight cars still to be delivered box cars account for 41,781 of the total, coal cars 38,736, refrigerator cars 11,492 and stock cars 2,192.



Kadel & Herbert

The President at the Controller of a Milwaukee Electric Locomotive

D. T. & I. to Electrify

RAPID PROGRESS is being made, says the Ford News, on the new equipment at the Rouge Power House, which will furnish power for the electrification of the first unit of the Detroit, Toledo & Ironton.

The original boiler capacity consisting of four boilers rated at 2,647 hp. but developing more than 6,500 hp. each is being doubled. The present generating system consisting of two 12,500 kilowatt turbine generators is being replaced by eight turbine generators each rated at 30,000 kilo volt amperes. The steel work on three of the giant stacks is already completed and one of the turbines, among the largest in the world, is also nearing completion.

The present plans which will mark what the News terms a new era in the history of the Detroit, Toledo & Ironton, in addition to the installation of the big turbine units at the Rouge Plant, call for the building of new locomotives, the construction of 13¼ miles of double track between River Rouge Plant and the Flat Rock yards and many other changes incidental to the electrification of the line.

In keeping with the general improvements that the Detroit, Toledo & Ironton has undergone under Ford operation, electrification will give the road a vastly superior motive power, the News says. "The electric locomotive is much more powerful than the steam locomotive, and is approximately 50 per cent cheaper to operate. It is capable of rendering practically continuous service, and can be inspected in one hour, whereas the steam engine requires several hours. Moreover, the electric locomotive becomes a generator on a down grade, putting current back into the wires, thus utilizing the otherwise wasted energy of inertia and gravity."

The account in the Ford News continues: "The new electric locomotives for the Detroit, Toledo & Ironton for freight service will weigh 360 tons, and have a normal capacity of 4,000 hp., and be capable of producing 5,000 hp. for an hour. They will have 16 driving axles and will develop 108,000 lb. drawbar pull at 25 miles an hour. The maximum speed will be 45 miles an hour. The power will be supplied by the River Rouge Power House. The pressure on the power transmission line will be approximately 150,000 volts, the trolley line carrying 22,000 volts.

"The new Ford line, the Detroit & Ironton, to be operated in conjunction with the Detroit, Toledo & Ironton system, is now making rapid strides toward completion. The construction work is assuming huge proportions. This new road will be the first division to be operated with electric motive

power. The line is to be double-tracked and will connect the Rouge Plant of the Ford Motor Company with the Detroit, Toledo & Ironton north of Flat Rock, Mich. Although the Detroit & Ironton is to be but 13¼ miles long, it will effect enormous savings in switching charges between the Rouge Plant and the present Detroit, Toledo & Ironton terminus.

"A large amount of work has been necessary on the division between the Rouge Plant and Oakwood Boulevard in making fill for approaches and on construction of a temporary trestle over the Rouge River. This trestle will be replaced with a re-enforced concrete bridge.

"One very expensive feature of railroad construction is eliminated in connection with the Detroit & Ironton by the use of refuse sand from the Rouge Foundry for grading purposes. The tracks are being laid with 100-pound rail and creosoted ties. Each tie will be protected with tie plates which greatly adds to the life of the ties as well as forming a more secure track.

"At present a force of 225 men are engaged in rushing this work to completion and it is expected that the latest addition to the Ford railroad interests will be operating in its entirety by October 1, 1923.

"In connection with this line, which may eventually become part of the main line of the Detroit, Toledo & Ironton, extensive receiving and classification yards are being built immediately below the Detroit & Ironton at Flat Rock. In these yards all incoming trains will be broken up and arranged for dispatch, thus expediting the delivery of shipments to the consignee."

Freight Car Loading

THE JULY 4 HOLIDAY resulted in a reduction of the freight car loadings for the week ended July 7, to 854,748 from the million-week level which has been ruling for the past several weeks. The loadings for the week ended July 7, however, were 147,723 in excess of those for the corresponding week of 1922 and 214,213 in excess of the comparable week in 1921. As compared with the corresponding weeks of both 1921 and 1922, both of which included the July 4 holiday, increases were shown in all commodities except grain. The grain loadings for the week ended July 7, 1923, were 31,069 or 3,907 less than the corresponding week of 1922 and 7,373 less than 1921.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 7, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded		
										Corresponding period		
										1923	1922	1921
Eastern	1923	5,200	2,866	41,850	3,482	5,318	9,707	57,884	77,718	204,025	158,919	153,326
	1922	7,718	2,263	7,008	1,967	4,519	6,831	59,142	69,471	142,651	142,651	142,651
Allegheny	1923	1,613	2,351	52,314	7,130	3,365	15,045	43,110	71,235	196,163	141,240	129,183
	1922	1,822	1,933	13,320	4,245	2,544	11,408	44,747	61,221	85,478	85,478	85,478
Pocahontas	1923	141	166	23,615	490	1,563	243	5,393	4,219	35,830	32,760	26,373
	1922	151	173	22,945	272	1,150	22	4,775	3,272	28,643	28,643	28,643
Southern	1923	3,146	1,867	18,710	1,228	19,104	1,482	33,266	34,668	113,471	103,735	98,544
	1922	3,666	1,971	15,190	811	16,315	1,175	31,738	32,869	103,735	103,735	103,735
Northwestern	1923	6,951	7,173	9,185	947	10,814	44,009	26,417	31,900	137,396	120,647	89,402
	1922	7,142	6,130	6,048	1,729	8,292	34,430	26,226	30,650	116,339	116,339	116,339
Central Western	1923	9,297	8,667	10,881	336	7,223	2,670	31,032	46,233	116,339	102,085	93,013
	1922	10,242	7,488	3,895	404	5,222	1,911	30,430	42,493	85,478	85,478	85,478
Southwestern	1923	4,721	2,032	3,663	157	6,789	440	12,378	21,344	51,524	47,639	50,694
	1922	4,235	1,746	2,454	105	6,136	354	12,142	20,487	47,639	47,639	47,639
Total West. Dists.	1923	20,969	17,872	23,729	1,440	24,826	47,119	69,827	99,477	305,259	270,371	233,109
	1922	21,619	15,364	12,397	2,238	19,650	36,675	68,798	93,630	270,371	270,371	270,371
Total all roads	1923	31,069	25,122	160,218	13,770	54,176	73,596	209,480	287,317	854,748	707,025	640,535
	1922	34,976	21,704	70,860	9,533	44,178	56,111	209,200	260,463	707,025	707,025	707,025
	1921	38,442	20,623	123,970	3,709	34,679	26,319	184,583	208,210	640,535	640,535	640,535
Increase compared...	1922	3,907	3,418	89,358	4,237	9,998	17,485	280	26,854	147,723	147,723	147,723
Decrease compared...	1921	3,907	3,418	36,248	10,061	19,497	47,277	24,897	79,107	214,213	214,213	214,213
Increase compared...	1921	7,373	4,499	36,248	10,061	19,497	47,277	24,897	79,107	214,213	214,213	214,213
Decrease compared...	1921	7,373	4,499	36,248	10,061	19,497	47,277	24,897	79,107	214,213	214,213	214,213
July 7	1923	31,069	25,122	160,218	13,770	54,176	73,596	209,480	287,317	854,748	707,025	640,535
June 30	1923	37,127	30,679	185,757	14,745	79,249	80,791	244,921	348,501	1,021,770	862,845	776,079
June 23	1923	33,958	29,251	183,350	14,828	78,068	82,041	240,403	340,841	1,002,740	866,321	775,447
June 16	1923	33,903	28,461	187,009	15,167	78,058	79,298	241,947	343,410	1,007,253	848,657	775,328
June 9	1923	34,390	32,723	190,149	14,804	76,380	76,092	242,766	345,945	1,013,249	836,208	787,283

Compiled by Car Service Division, American Railway Association.

Permanent Headboards Between Sections of Pullman Sleepers

FOR SOME TIME the Pullman Company has been working on the development of the interior arrangement of its standard sleeping cars with a view to increasing the privacy of the sections when the cars are made up for the day. The first step in this development, which was illustrated in the March 3 *Railway Age*, page 514, consisted in the installation of permanent headboards between the sections, extending out from the side of the car flush with the side of the upper deck.

To complete the partition when the berths are made up, a removable section of the headboard is locked in place against the edge of the permanent partition.

The next step in this development is shown in the illustration. In this case the permanent section of the headboard has been extended out farther from the side of the car, and carried across the ceiling so that each pair of sections in effect is in a separate compartment with an arch



New Pullmans Have Permanent Headboards; Telescopic Extensions in Place for Night Use at the Left

opening between the compartments. In this construction the headboard is completed for night use by sliding out a section which telescopes inside the permanent partition. This is automatically locked in place by a latch in the end of the seat which can be released with the berth key.

This type of construction has been applied in a combination 10-section observation car, of which 30 have already been built. Other than in the headboard arrangement, the interior design of the cars does not differ from the standard Pullman sleeping car except that the dome lights, which are located between the sections in the standard cars, are located, one in the center of each pair of sections. There is also a departure from the customary interior finish. The interior steel work below the upper decks is grained and stained to represent Italian walnut, with which is combined upholstery and carpet of blue.

Mo. P. Reduces Freight Claims

THE MISSOURI PACIFIC reduced its freight claim payments from \$2,071,107 in 1921 to \$901,862 in 1922, and the percentage of claim payments to freight revenues from 2.54 per cent to 1.22 per cent. The claims paid on carload shipments last year totaled \$585,305, and on less-than-carload shipments \$316,556, compared with \$1,375,518 and \$695,590, respectively in 1921. Unlocated loss of entire package was reduced from \$245,400 in 1921 to \$58,488 in 1922, or 76 per cent; other than entire package, from \$79,551 to \$15,918, or 79 per cent; unlocated damage, from \$383,864 to \$20,382, or 97 per cent; rough handling of cars, from \$216,794 to \$191,206, or 11 per cent; defective or unfit equipment, from \$389,743 to \$157,038, or 59 per cent; delay, from \$208,798 to \$66,527, or 68 per cent; wrecks; from \$210,740 to \$57,444, or 72 per cent; error of employees, from \$60,006 to \$21,252, or 64 per cent; and robbery of other than entire package, from \$121,679 to \$71,550, or 41 per cent.

The results obtained during 1922 are attributed to an educational campaign, the purpose of which is to bring about a correct and uniform understanding of the proper handling of freight. To instruct and correct irregularities, traveling representatives visit stations and terminal junction points to discuss existing rules and regulations with station and yard forces and to impart such information as is necessary to a correct understanding of the essentials necessary to the proper handling of freight traffic in order to prevent claims. These representatives also visit industries located on the line, such as grain elevators, flour mills, cotton compressors, etc., and offer suggestions regarding the proper preparation of cars and the correct method of loading and bracing where it is necessary to protect the lading against damage in transit.

A campaign is also in effect among car inspectors, agents and station forces to bring about a more careful inspection of cars and to eliminate placing for loading cars which have not been properly inspected and found fit for the commodity with which they are to be loaded. When freight is found damaged at the destination station, a careful inspection is made of the physical condition of the car and the contents of the car to determine the cause of the damage in order that corrective measures may be applied. During the past two years an inspection at point of origin on carloads of fruits, vegetables and other perishable commodities loaded at stations on the line, has been made. This inspection not only covers the condition of the car and refrigeration, but of the commodity loaded as well. This enables the railroad to determine the handling accorded the shipment, the condition of the commodity when loaded and whether it was fit to withstand ordinary handling at the time of shipping.

The reduction in claims caused by delay was brought about through the prompt handling of carload business by the transportation department, which not only resulted in cutting loss and damage claims but prevented delays to equipment as well. It has been found that the prompt movement of freight not only means the prompt movement of the commodity but the prompt handling of equipment, which in turn decreases the opportunity for theft, deterioration, fires, freezing, damage by the elements, rough handling and losses from open cars. The handling of less-than-carload business at large stations is accomplished by the veri-check system, which enables the agent to establish personal responsibility covering the entire handling of package freight from the time it is received at his warehouse until it is stowed in the cars. It also enables the warehouse foreman to determine what his forces are doing, to learn where any extraordinary conditions exist and enables the special service department to ascertain through whose hands the unlocated losses are passing. Statistical reports and bulletins are issued at regular intervals for the information of all concerned.

More Recollections of a Secretary

By One to a G. M.

BEFORE RISING FROM THE OBSCURITY of stenographer to the comparatively dizzy heights of secretary to the general manager, I was of the opinion, in common with most railroad men in minor positions, that the high officials were inhuman czars, who delighted in wholesale lay-offs and other equally unpleasant acts, merely to gratify their personal vanity in the exercise of their power. They did not impress me as human beings at all. They were, to me, mere shadowy figures who haunted my dreams at night.

This state of mind may seem far-fetched, but my experience has been that a very great number of men in the ranks hold the same views that I did. This feeling is a natural one on some railroads, where the officials feel that it is beneath their dignity to appear human. Given a condition of this sort, nothing but harm can result. There is no common meeting ground, no mutual interests, nothing but friction, between men and management.

The very best thing to establish esprit de corps on a railroad would be for every man in the ranks to spend a day or two on the GM's car. A GM in pajamas, hunting for his toothbrush, is not at all the fearsome individual that he appears when garbed in the armor of clothes and a collar and tie.

Of course, having every man spend some time on the GM's car is impracticable, but there are many ways in which an official can change this harmful mental attitude on the part of the men.

My particular GM was a past master in the art of making real friends of the men and he lowered his dignity not one whit while so doing. He made the men feel that he was interested in them, not merely as cogs in the machine, but as thinking, living human beings.

The idea of helping the railroad by this means, while important, was only incidental, for he did have a real and true interest in his "family" (as he loved to call them), quite apart from any business reasons. His sincerity was so apparent that even the most recalcitrant of the men could not help liking him.

Many railroad officials have this same knack, and their men are invariably as loyal as the leather lunged agitators permit them to be and far more loyal than the employees on railroads where the officials are known only to men by hearsay.

During my long period of close contact with the big boss, it was my privilege to observe a good many incidents, of which the following will serve to illustrate my point further.

The GM had rather deep-rooted religious principles (even years of railroading had failed to knock them out of him) but he was far from narrow-minded. It so happened that while he was in the shop in a small town down the line a blacksmith was stricken with heart disease. A doctor was hastily summoned, and his verdict was that the man would be dead in an hour. The blacksmith was one of the many men whom the boss knew. Although his religion was radically different from that of the GM, I was dispatched to the phone at once to summon a pastor to administer the last rites to the dying man. My phone call developed that the pastor was visiting three or four miles out of town, at a farmhouse where there was no telephone. The boss hopped into the master mechanic's car and, hatless and coatless, drove out into the country, picked up the pastor and, by consummate driving over the rough country roads brought him back in time.

There was nothing premeditated about his act. He forgot for the time being that he was GM and acted simply as one man helping another. There was no thought of profiting from the incident; yet, this particular shop, which had

been a hotbed of labor agitation, simmered down to comparative quiet, and the GM was a popular figure there.

The boss was the most approachable man in his office. Anyone desiring to see him could be assured of a brief hearing at least.

One of our oldest and most reliable engineers developed an invention. The boss had it carefully investigated and it was found to be hopeless.

Inventors as a rule are very sensitive on the subject of their brain-children, and this old engineer was no exception to the rule. Just the least bit of careless handling, and this capable and conscientious employee could have been transformed into a surly and discontented one, not worth his salt.

But the boss appreciated the situation and acted accordingly. He called in the mechanical engineer and explained to him the necessity for keeping the good will of the inventor. The mechanical engineer did his work well and tactfully. He went into the subject patiently and in full detail with the engineer, and proved to him that his invention was intrinsically of little value. The engineer was disappointed, of course, but not resentful. He felt that the railroad had given him a square deal, which was the important thing.

The lesser officials were not overlooked by the boss in his efforts to establish a smooth-running organization. One of his maxims was: "The men are the brawn of the railroad, the officials the brains. As in the human body, so with the railroad—brains and brawn must co-operate and co-ordinate in every way to secure maximum efficiency."

It is a patent, but often overlooked fact, that neither the brains nor the brawn can function properly if one or the other is afflicted with the canker of dissatisfaction.

Hence the officials as well as the men were made to feel that the boss was their friend, both officially and personally.

Of course, there were dislikes and personal animosities among the officials. John Jones, the master mechanic, didn't like Bill Brown, the superintendent, because Bill said John had a big nose, or for some other of the silly reasons that cause these internecine feuds. Nevertheless, John Jones co-operated with Bill Brown to the fullest extent and Bill did the same for John, because each felt (and rightly, too) that by so doing he was serving the GM.

Under the GM's system there was no such thing as "getting something on" the other fellow and telling it to the boss. The boss felt that he was sufficiently astute to discover a man's derelictions for himself without the aid of a host of toadying informers. Men with "snitching" proclivities were given but short shrift on our railroad.

It is peculiar and amazing that men with a high sense of honor will sometimes surround themselves with an army of informers. Wherever this is done, the result is invariably a lessening of the morale and a constant succession of petty quarrels and bickerings among the subordinates.

The organization I speak of was not ideal by any means. It had its weaknesses and its weak sisters, but, buoyed up as it was by the unswerving loyalty of the men to the boss and the human interest of the boss in his organization, the railroad ran smoothly and profitably.

Years of patient building were required to bring the operating personnel to its high standard of efficiency and capability. The "pull-together" spirit was not a mushroom growth of a day. Yet the time and labor involved in the building were well spent, as evidenced by the results obtained by the smooth-running machine that they produced.

DURING the seven years ending July 1 in which the death benefit plan for employees has been in effect, the Atchison, Topeka & Santa Fe has paid \$1,571,000 to the widows, children and other beneficiaries of 1,731 employees.

Operating Statistics of Large Steam Roads—Selected Items for the Month of May, 1923,

										FREIGHT SERVICE					
										Average number of locomotives on line daily					
										Service-able	Un-service-able	Per cent un-service-able	Stored		
										Gross. Excluding locomotive and tender	Net. Revenue and non-revenue	Service-able	Un-service-able	Per cent un-service-able	Stored
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										Gross. Excluding locomotive and tender	Net. Revenue and non-revenue	Service-able	Un-service-able	Per cent un-service-able	Stored

Compared with May, 1922, for Roads with Annual Operating Revenues above \$25,000,000.

Region, road and year	Average number of freight cars on line daily				Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car-day	Net ton-miles per car-day	Car-miles per car-day	Pounds of coal per ton-mile			Passenger service	
	Home	Foreign	Total	Per cent un-service-able						Net ton-miles per day	Net ton-miles per locomotive	Net ton-miles per gross ton-mile	Train-miles	Passenger-train-miles
New England Region:														
Boston & Albany.....1923	1,608	9,026	10,634	3.2	1,098	466	23.4	497	32.0	13,404	181	309,159	2,044,251	2,048,786
.....1922	3,611	4,625	8,236	9.4	1,021	368	16.9	320	26.9	6,697	195	307,948	2,008,786	2,008,786
Boston & Maine.....1923	12,506	26,792	39,298	9.3	1,162	489	22.3	272	17.7	4,358	173	833,743	4,531,090	4,531,090
.....1922	16,884	13,582	30,466	18.4	1,114	439	18.4	233	17.1	1,896	147	817,915	4,531,191	4,531,191
N. Y., New H. & Hartf.....1923	17,488	30,511	47,999	15.0	1,248	533	22.6	201	13.0	4,883	175	1,023,544	6,330,530	6,330,530
.....1922	24,450	14,738	39,188	25.8	1,223	480	17.9	168	12.8	3,332	154	1,022,871	6,479,476	6,479,476
Great Lakes Region:														
Delaware & Hudson.....1923	8,426	9,851	18,271	7.8	1,798	955	34.3	694	29.4	14,310	195	193,335	1,004,831	1,004,831
.....1922	11,391	5,395	16,786	8.7	1,627	744	25.9	361	20.5	6,841	181	193,798	1,016,353	1,016,353
Del., Lack. & Western.....1923	12,795	13,292	26,087	3.9	1,766	814	25.9	587	23.7	15,423	184	498,522	3,584,450	3,584,450
.....1922	19,078	6,176	25,254	10.3	1,554	633	20.1	368	26.1	9,356	175	503,939	3,656,285	3,656,285
Erie (inc. Chic. & Erie).....1923	22,932	32,717	55,649	9.5	2,089	1,010	28.3	624	31.4	15,048	135	661,824	5,039,839	5,039,839
.....1922	39,833	14,995	54,828	18.2	1,870	788	23.7	356	23.2	8,453	140	680,212	4,818,821	4,818,821
Lehigh Valley.....1923	19,731	17,559	37,290	5.4	1,729	855	29.6	462	22.9	13,072	169	352,088	2,780,272	2,780,272
.....1922	33,067	7,545	40,612	12.0	1,655	718	24.0	282	17.7	8,714	158	348,967	2,718,851	2,718,851
Michigan Central.....1923	9,064	23,764	32,828	7.2	1,763	723	21.5	452	30.8	8,116	120	605,947	5,275,740	5,275,740
.....1922	17,496	10,624	28,120	18.6	1,672	616	19.2	354	28.7	5,443	117	551,247	4,896,453	4,896,453
New York Central.....1923	57,555	105,201	162,756	9.4	2,219	1,019	28.1	518	29.2	13,030	118	2,558,453	20,360,613	20,360,613
.....1922	92,570	45,666	138,236	19.1	1,763	723	21.5	452	30.8	8,116	120	605,947	5,275,740	5,275,740
N. Y., Chic. & St. L.....1923	2,859	12,965	15,824	9.0	1,662	657	21.8	717	48.7	9,260	129	151,958	852,106	852,106
.....1922	6,695	8,260	14,955	15.2	1,560	585	19.4	574	43.5	7,005	111	149,785	828,195	828,195
Pere Marquette.....1923	6,557	20,469	27,026	4.2	1,428	692	25.8	334	18.2	4,139	129	273,641	1,398,755	1,398,755
.....1922	11,206	9,446	20,652	13.0	1,310	592	22.7	299	19.4	2,814	124	246,662	1,284,641	1,284,641
Pitts. & Lake Erie.....1923	8,181	15,161	23,342	16.3	2,559	1,506	44.8	435	15.6	43,908	74	118,842	622,170	622,170
.....1922	20,994	8,564	30,558	34.3	6,017	1,880	10.45	93	3.9	12,451	89	114,933	583,827	583,827
Wabash.....1923	7,975	12,982	20,957	3.3	1,571	668	21.8	638	39.5	5,529	143	444,570	2,613,948	2,613,948
.....1922	12,855	9,021	21,876	12.3	596	4,439	20.3	489	33.6	4,426	144	555,285	3,055,385	3,055,385
Ohio-Ind.-Allegheny Region:														
Baltimore & Ohio.....1923	49,146	53,653	102,793	5.8	1,704	861	32.3	634	30.6	12,504	178	1,518,994	9,596,408	9,596,408
.....1922	71,996	32,135	104,131	14.4	1,538	739	28.7	382	20.4	7,596	171	1,498,162	9,246,788	9,246,788
Central of New Jersey.....1923	12,352	15,697	28,049	9.2	1,517	750	32.2	274	13.6	11,068	194	358,953	1,677,973	1,677,973
.....1922	21,231	7,821	29,052	6.1	1,218	555	24.4	134	8.0	5,608	207	355,994	1,757,554	1,757,554
Chicago & Eastern Ill.....1923	11,060	5,662	16,722	21.0	1,477	714	27.4	323	17.7	5,716	189	237,539	1,466,320	1,466,320
.....1922	16,855	3,874	20,729	13.4	6,000	1,324	26.9	235	12.4	5,163	161	216,494	1,412,587	1,412,587
Cleve., Cin., Chic. & St. L.....1923	9,541	24,281	33,822	5.8	1,977	973	30.0	664	33.2	9,443	130	728,767	4,371,973	4,371,973
.....1922	18,285	18,278	36,563	14.3	7,237	1,842	28.1	501	28.6	7,672	122	697,440	4,554,776	4,554,776
Elgin, Joliet & Eastern.....1923	8,408	8,887	17,295	6.9	2,297	1,246	42.1	351	12.8	13,208	125
.....1922	8,992	6,133	15,125	10.9	1,888	1,201	38.2	251	9.6	8,257	133
Long Island.....1923	1,349	6,458	7,807	2.8	756	295	24.3	63	4.5	1,246	330	203,295	1,213,832	1,213,832
.....1922	2,026	3,347	5,373	4.7	1,800	223	19.6	58	4.9	784	388	202,279	1,199,356	1,199,356
Pennsylvania System.....1923	156,295	129,003	285,298	5.4	698	906	33.8	544	25.4	14,269	144	5,158,819	34,830,898	34,830,898
.....1922	211,221	77,225	288,446	12.7	59,388	1,581	27.5	322	17.6	8,520	145	5,025,063	32,652,513	32,652,513
Philadelphia & Reading.....1923	14,523	23,018	37,541	4.4	1,720	920	35.6	570	24.6	19,147	174	518,601	2,370,958	2,370,958
.....1922	25,871	10,371	36,242	5.6	8,572	1,428	28.1	267	14.1	8,630	179	509,476	2,331,880	2,331,880
Pocahontas Region:														
Chesapeake & Ohio.....1923	28,170	17,427	45,597	8.7	2,337	1,273	40.8	797	32.2	14,228	124	471,471	2,757,516	2,757,516
.....1922	36,552	13,991	50,543	14.3	1,131	1,312	41.9	669	27.8	13,278	120	441,237	2,497,490	2,497,490
Norfolk & Western.....1923	25,301	13,753	39,054	5.1	2,201	1,194	41.3	886	34.9	15,537	186	405,451	2,547,798	2,547,798
.....1922	29,964	10,266	40,230	5.7	614	2,350	45.0	1,023	40.2	18,471	154	395,025	2,399,091	2,399,091
Southern Region:														
Atlantic Coast Line.....1923	15,193	15,729	30,922	9.8	1,271	493	20.1	432	33.4	2,748	130	741,216	4,895,371	4,895,371
.....1922	21,301	9,759	31,060	16.3	1,245	452	18.5	345	29.7	2,177	119	717,057	4,594,867	4,594,867
Central of Georgia.....1923	2,015	6,127	8,142	7.2	1,077	510	24.9	609	33.3	2,601	169	326,439	1,658,866	1,658,866
.....1922	4,689	3,307	7,996	19.0	1,077	467	20.8	426	27.1	1,795	145	327,311	1,646,290	1,646,290
I. C. (inc. Y. & M. V.).....1923	50,882	38,673	89,555	6.8	1,033	1,659	27.4	737	41.4	8,279	145	1,607,612	10,670,335	10,670,335
.....1922	44,025	20,339	64,364	11.5	6,092	1,597	25.7	604	37.1	6,335	136	1,499,323	9,406,392	9,406,392
Louisville & Nashville.....1923	26,972	26,770	53,742	14.4	55	1,174	31.3	605	31.7	6,476	177	1,058,765	6,109,236	6,109,236
.....1922	34,495	18,930	53,425	12.0	79	1,166	31.2	613	32.8	6,529	160	1,011,452	5,889,313	5,889,313
Seaboard Air Line.....1923	9,632	12,052	21,684	21.9	1,218	478	20.9	398	28.8	2,426	155	578,893	3,431,010	3,431,010
.....1922	13,039	10,278	23,317	34.3	1,172	436	19.3	303	24.2	1,999	156	555,712	3,165,724	3,165,724
Southern.....1923	25,652	35,486	61,137	9.7	1,192	515	23.8	456	29.1	4,015	198	1,320,508	7,799,064	7,799,064
.....1922	36,977	20,509	57,486	19.6	1,134	459	20.8	335	23.9	2,773	185	1,286,209	7,273,640	7,273,640
Northwestern Region:														
Chic. & N. Wn.....1923	37,756	38,454	76,210	7.2	1,297	567	24.8	394	24.6	3,546	154	1,620,783	9,999,118	9,999,118
.....1922	46,192	22,526	68,718	8.5	4,200	1,141	23.2	273	21.1	2,232	165	1,605,432	9,904,740	9,904,740
Chic., Milw. & St. P.....1923	39,823	37,508	77,331	9.0	1,440	632	24.7	454	28.8	3,191	150	1,503,495	9,144,335	9,144,335
.....1922	51,401	21,157	72,558	16.0	1,361	597	23.4	387	24.8	2,549	148	1,477,317	8,923,390	8,923,390
Chic., St. P., M. & O.....1923	2,514	8,901	11,415	10.7	93	1,018	21.7	373	25.1	2,465	169	310,657	1,804,182	1,804,182
.....1922	5,015	10,526	15,541	11.0	1,840	975	21.5	256	17.2	2,304	158	318,261	1,794,829	

General News Department

The Old Timers' Telegraphers Association will meet at Denver, Col., beginning September 8, 1923.

In a fire at Depew, N. Y., on July 8, the office and stock room of the New York Central car shops were badly damaged. Estimated loss \$50,000.

Three persons were killed and five were injured when a locomotive and three baggage cars of a train on the Los Angeles & Salt Lake were derailed three miles west of Sandy, Utah, on July 15.

Fire damaged the shops of the Kansas City Southern at Shreveport, La., on July 11, destroying a building 500 ft. long and 85 ft. wide and 72 box cars at an estimated loss of \$200,000. The origin of the fire was not determined.

The Norfolk & Western has been authorized by the Interstate Commerce Commission to install automatic control on one passenger locomotive division between Shenandoah, Va., and Hagerstown, Md., in lieu of the installation originally required.

The Memphis Special express train, eastbound, of the Southern Railway, was derailed near Scottsboro, Ala., on July 13, and four sleeping cars and two coaches fell down a bank, some of them being overturned. One passenger was killed and 15 were injured.

A fire on July 18 destroyed the entire second floor of the Erie's freight house at Pavonia avenue and Kelso street, Jersey City, N. J. Little damage was done to the first floor where freight was being handled. The portion of the building destroyed was occupied by the regional mechanical department and other offices. The loss is estimated at \$50,000.

A prize of two dollars is to be given semi-monthly by the Pennsylvania News for the Central Region—the semi-monthly newspaper for employees of the Pennsylvania Railroad—to the employee who sends in the best freight or passenger business tip. Thousands of tips have been sent in by alert men and women in the employ of the road; and this offer is expected to increase the number. No prizes will be given to employees regularly engaged in soliciting. At the end of the year, a grand prize of ten dollars will be given.

California Stop Law for Automobiles

The state of California has adopted a motor vehicle law, effective August 31, which provides that operators of all motor vehicles carrying passengers for hire, school omnibuses and motor trucks carrying explosives or inflammables must bring their cars to a complete stop before crossing the tracks of any steam railroad or of any interurban or suburban electric railway. The penalty is a fine of not exceeding \$500 or imprisonment not exceeding six months or both.

St. Louis-San Francisco Offers

Insurance to Employees

The St. Louis-San Francisco has arranged with the Metropolitan Life Insurance Company to issue group insurance to its officers and employees. Those earning \$200 a month or less will be permitted to take out \$3,000 insurance, of which the railroad will pay 40 per cent of the premium on the first \$1,000 and the employee all of the premium on the remainder. Those earning between \$200 and \$300 a month may take out \$4,000, of which the company will pay 40 per cent on the first \$2,000. Individuals receiving over \$300 a month will be permitted to take \$5,000 of insurance, of which the railroad will pay 40 per cent of the premium on the first \$3,000. The \$2,000 of extra insurance at the low rates offered can be obtained without medical examination, regardless of age or physical condition, provided 75 per

cent of the individuals in that class take advantage of the offer. Besides life insurance, payable at death, the policies will carry total disability clauses.

Long Island Plans Expenditure

of \$84,000,000 in Ten Years

George Le Boutillier, vice-president of the Long Island, addressing the Long Island Press Association and the Long Island Association at the Clifton Hotel, Patchogue, L. I., on July 16, announced that he had prepared a program for additions and betterments on the Long Island calling for the expenditure of \$84,000,000 in the next ten years.

Newfoundland Takes Over Its Railway

The Reid-Newfoundland Railway, which has been aided by the government for a long time, is finally to be taken over, the governor having, on July 15, approved bills passed by the legislature authorizing the expenditure of \$2,000,000 for the railway company's property. The line extends across the island from east to west and there are several branches. Boat connection is made with North Sydney, C. B. The total length of railroad line is about 900 miles, all of 3-ft., 6 in. gage. The reports say that counter claims by the government and by the railway company are mutually withdrawn. The government will acquire eight steamers and a dry dock at St. Johns.

A Sixteen-Thousand Ton Train

The Great Northern established a record in hauling ore on June 21 when a train of 16,360 tons was moved by one locomotive to Allouez Dock at Superior. Mallet engine No. 2022 hauled 125 loaded ore cars, from an assembly yard at Kelly Lake to Baden, Minn., a distance of 39 miles, where 25 more loads were added to the train and hauled to Allouez, a further distance of 64 miles. Between Kelly Lake and Baden the train was hauled up a 0.3 grade about three miles long. The train consisted of:

Ore, 150 cars, 87 tons each.....	13,050 tons
Cars, 150 at 20 tons each.....	3,000 tons
Engine and tender.....	270 tons
Caboose	10 tons
Superintendent's business car.....	30 tons

Total 16,360 tons

The Yardmaster's Responsibility for Rough Handling

"A yardmaster has more to do with the handling of cars which would cause damage than any other man on the railroad. His success in eliminating damage depends largely upon the organization of his men. I believe that loss and damage in the yard is controlled by engine foremen. I have no regular schedule for visiting my engines when they are working and consequently happen along when not expected. My visits are more frequent at night than at any other time as all new men are put on night shifts first. If I see a crew handling cars too roughly, or in any manner that would cause damage I stop them at once and get them together for a few minutes' lecture, which I try to make so impressive that I shall not have to stop that crew again. I devote a lot of my time to watching house and mill engines, where invisible damage is usually done. I try to keep my best foremen on these jobs. I believe it is necessary to have the help and assistance of my foremen at all times and I always keep my engine foremen of the longest experience on jobs where merchandise and mill products are handled."—From a paper read before the Over, Short and Damage Committee of the Michigan Central at Chicago on April 4 by J. Farley, yardmaster at Joliet, Ill.

Consolidation of the Nickel Plate

The properties formerly owned or operated by the New York, Chicago & St. Louis, the Chicago & State Line, the Lake Erie & Western, the Fort Wayne, Cincinnati & Louisville and the Toledo, St. Louis & Western will, effective July 1, be operated by the New York, Chicago & St. Louis Railroad Company. The operations of the consolidated company shall be conducted by districts, to be known as: the Nickel Plate district; the Lake Erie & Western district; and the Clover Leaf district. The operation of the Nickel Plate district and of the Lake Erie & Western district will be under the direction of C. E. Denney, vice-president and general manager, with offices at Cleveland, Ohio. The operation of the Clover Leaf district will be under the direction of W. L. Ross, senior vice-president, with offices at Toledo, Ohio.

Wage Increases

The New York Central Railroad, following protracted negotiations, announced on July 16 that for shopmen, about 20,000 in number, a general advance in wages of 3 cents an hour had been made, bringing the mechanics' rate up to 73 cents. Tentative agreements were reached between the committee and the management on working conditions, but certain of the revisions in the agreements must first be approved by a referendum vote of the union. Negotiations are now under way on the request for similar increases on other roads in the New York Central System.

The Lehigh Valley has granted the following wage advances to its maintenance of way employees: Track foremen and assistant foremen, \$5 a month; foremen and assistant foremen in the bridge and building department, \$2.50 to \$3.50 a month. Clerical and station employees on this road have received increases of from one to four cents an hour. The following increases have been granted to the shop crafts employees: Machinists two cents an hour, carmen one to two cents an hour, helpers one to two cents an hour, apprentices one cent an hour, helper apprentices one to two cents an hour, car cleaners two cents an hour, stationary engineers, firemen and water tenders two cents an hour.

The Labor Board, in three decisions made public on July 18, ruled that contracts entered into by the Western Maryland with several contracting firms for the operation of its railway shops and for the performance of work formerly done by its signal department and maintenance of way employees, are in violation of the transportation Act. The provisions of the contracts affecting the wages and working rules of the workmen were declared to be in violation of the decisions of the Labor Board. The decisions in these cases are the same as those handed down by the Board in decision 1361, which was reported in the *Railway Age* of November 25, 1922, page 985, and the same dissenting opinion was filed by Messrs. Baker, Barton and Higgins, members of the Board.

* * *



Underwood & Underwood

President Harding's Special Arriving at Cedar City, Utah

Traffic News

The last shipment of silk from Japan, which arrived in New York City on June 22, at 10:15 a. m., came through over the Canadian Pacific in 13 days, 11 hours, 49 minutes, from Yokohama. The Canadian Pacific people say that their steamship, the "Empress of Canada," made the voyage from Yokohama to Vancouver in 8 days, 21 hours, 14 minutes. The time through to New York was about 6 hours better than the best previous record.

Charles F. Wolcott, formerly connected with the Pennsylvania Railroad, has been appointed district manager of the Car Service Division of the American Railway Association, at Pittsburgh, Pa. The territory making up the Pittsburgh district includes the western half of Pennsylvania, western New York, northwestern Maryland, northern West Virginia and Ohio east of a line drawn from Parkersburg, W. Va., to Mansfield, Ohio, thence to Buffalo, N. Y., but excluding Buffalo, Niagara Falls and Suspension Bridge.

Reduced rates will prevail for another period of six months from August 1 on all traffic to and from points in southern Texas when routed via the Kansas City, Mexico and Orient by an order of the Interstate Commerce Commission issued July 18 postponing until February 1, 1924, the expiration of permission given last January for the establishment of differential rates because of the Orient's financial difficulties. On the differential basis when the Orient lines are used as an intermediate carrier by another railroad or a shipper, lower rates apply on the traffic than when routed via other roads.

A bureau for the prevention of pilferage at and around freight houses is proposed in New York City, with a view to combining the efforts of the different railroads and steamship lines toward the suppression of this kind of losses. The Department of Commerce, Washington, has issued a circular suggesting the formation of such committees at all important ports; and in New York City, on June 28, a committee was established to devise ways and means for starting such a bureau. Director Klein, of the Bureau of Foreign and Domestic Commerce, finds that losses from theft and pilferage continue to grow, and to constitute a heavy tax on the export freight business. Investigation by the department has disclosed operations by well organized thieves who are able to remove goods from cases without leaving any trace of the robbery. Director Klein suggests that Federal legislation, especially the Carlin Act, ought to be amended so as to make more certain the conviction of thieves when they are caught.

Photographs on Tickets

The purchaser of a monthly commutation ticket on the Long Island railroad, who is unable to comply with the rule requiring him to write his name on the ticket, will hereafter be required to furnish a photograph of himself; and a new photograph must be furnished every month. The rule under which the tickets are issued includes the following provisions:

When a purchaser is unable to sign his or her name, the ticket seller will sign the name and require the purchaser to make his or her mark.

And in addition thereto the purchaser must furnish an individual bust photograph taken in ordinary street attire, and such photograph must be:

- (a) A good likeness of purchaser;
- (b) A properly finished photograph that will not fade;
- (c) Unmounted;
- (d) Exact dimensions—one inch square;
- (e) Pasted securely on ticket in an upright position by the ticket seller and then cancelled with an "L" punch through the photograph but not so as to mutilate the face.

DURING THE MONTH of June the Missouri-Kansas-Texas operated 2,713 passenger trains of which 94 per cent made schedule time or better.

Commission and Court News

Interstate Commerce Commission

The Ulster & Delaware has been relieved from compliance with the general reduced rates order of 1922 with respect to local class freight rates and non-competitive local commodity rates. Relief was granted on account of the carrier's precarious financial condition, but the commission says that officers of the road expect to meet all fixed charges under normal conditions, provided no further rate reductions are required.

At the hearing on the Pullman surcharge which was held at San Francisco on July 10, the Railroad Commission of California submitted data supporting its petition for the repeal of the surcharge. The Corporation Commission of Arizona, the Oregon Public Service Commission, the Washington Department of Public Utilities, the Nevada Public Service Commission, and the New Mexico Corporation Commission requested the California Commission to file protests on their behalf in the proceedings. H. T. Gordon, chief counsel of the California Railroad Commission, produced evidence to show that a falling off of sleeping car and parlor car travel resulted when the surcharge was put into effect. He also submitted data purporting to show that it does not cost the railroad companies more to transport passengers in Pullman cars than in ordinary coaches. A final hearing will be held on July 30, at Portland, Me.

Carriers Ask for Rehearing of Coal-Car Order

Railroads subject to the commission's order condemning the use of assigned cars for bituminous coal mines have asked for rehearing and modification of the order and, regardless of what action the commission takes on the petition, or if it is delayed, have asked that the effective date be postponed from September 1 to April 1, next year. The change in practice required is so revolutionary, they say, that it is bound to jeopardize their efforts to meet the transportation needs of the country. The petition concedes that the assigned car rule may have been perverted and abused and says that the petitioners are not averse to adoption of policing restrictions to prevent abuse in the future.

The petition estimates that the effect of the commission's decision will add more than \$100,000,000 yearly to the operating expenses of the railroads, thus reducing the estimated return of 5¾ per cent on the present basis of rates to 5¼ per cent.

Abolition of the assigned car rule also will handicap the railroads in handling the enormous amount of freight, as it threatens their fuel supply, next fall and winter. The petition was presented on behalf of the railroads by a committee of counsel headed by Henry Wolf Bikle.

State Commissions

The Missouri Public Service Commission has prohibited the Wabash from operating locomotives backwards on passenger trains between Columbia, Mo., and Centralia. Complaint against the road was filed last year by Prosecuting Attorney R. Hullen, of Boone county, following an accident in which three persons were killed.

Court News

Absence of Flagman No Excuse for

Negligence of Automobilist

The Alabama Supreme Court holds, in an action for damage to an automobile caused by collision with a freight train at a busy street crossing in a city, that where the driver of the automobile testified that his view was obstructed only by the top of his car and he did not hear because of the noise of his own car, the absence of a flagman, who was not always on duty at the crossing, did not excuse the driver's failure to stop, look and listen. Judgment for plaintiff was reversed.—*Central of Georgia v. Porter* (Ala.) 93 So. 394.

Commission's Award of Reparation for Excessive

Freight Charges Is Final and Appealable

The Illinois Supreme Court holds that an order of the State Public Utilities Commission denying an award of reparation because of excessive freight charges is a final order and appealable. The Illinois act is similar in this respect to the Interstate Commerce Act, in regard to which the Supreme Court of the United States takes the same view. Awards of reparation made by the Commission, however, do not stand on the same footing. They do nothing more than provide a right to the shipper to sue for reparation in a court of competent jurisdiction.—*Terminal R. Assn. of St. Louis v. Commission* (Ill.) 136 N. E. 797.

Decisions Under the Federal Employers'

Limited Liability Act

The Circuit Court of Appeals, Fifth Circuit, holds that a fireman employed in shifting cars on interstate trains, injured while attempting, in going to his work, to board the company's shuttle train, exclusively used for carrying employees to and from work, was engaged in interstate commerce.—*A. C. L. v. Williams*, 284 Fed. 262.

The West Virginia Supreme Court of Appeals holds that one employed in the repair or maintenance of an instrumentality which is used by an electric railway company engaged in interstate commerce, and which is essential to the successful operation of the railway (in this case the installation of a new rotary converter and transformer) is employed in interstate commerce.—*Halley v. Ohio Valley Electric Ry. Co.* (W. Va.) 114 S. E. 572.

The New York Appellate Division holds that an employee removing scrap from tracks used by interstate trains is engaged in interstate commerce; but an employee cutting grass and weeds on or near tracks used for interstate commerce is not so engaged, the latter duties having no relation to the operation of interstate trains.—*Quirk v. Erie*, 196, N. Y. Supp. 580.

The Iowa Supreme Court holds that a helper at a coaling station where coal was dumped from cars through a grate to a storage pit, to be taken directly to tenders used in interstate commerce, while engaged in breaking lumps too large to pass through the grate, was engaged in interstate commerce.—*Slatinka v. U. S. R. A.* (Iowa) 189 N. W. 20.

The Pennsylvania Supreme Court holds that an engineer taking an engine to a point within the state on an assignment for its attachment and use in the movement of an interstate freight train, who was killed by the derailment of the engine on the way, was engaged in interstate commerce, though the engine could have been used, for a day before its attachment to the interstate train, as an auxiliary in hauling intrastate traffic.—*O'Donnell v. Director General* (Pa.) 117 Atl. 82.

The Utah Supreme Court holds that an employee killed while repairing a locomotive which had been used in interstate commerce before being put in the shop for repairs, which took nearly a month, was not engaged in interstate commerce.—*Larkin v. Industrial Commission* (Utah) 208 Pac. 500.

FOUR PERSONS were killed and several others seriously injured on July 5 in a collision between a passenger train and a freight at Diggle, near Manchester, England, on the London, Midland & Scottish. The cause of the accident has not as yet been determined but Colonel J. W. Pringle, C. B., chief inspecting officer for railways for the Ministry of Transport, has been appointed to conduct an inquiry into the matter and his report will probably be issued shortly.

The passenger train, southbound from Leeds to Stockport, a double-header, had just left the tunnel near Diggle and was traveling at a high rate of speed when it hit the freight train which was taking water at Diggle. The leading locomotive of the passenger train and the first two coaches were overturned as was the freight locomotive. The passenger fireman and the freight engineman and two passengers were killed outright. Diggle is 15 miles north of Manchester. The spot where the accident occurred is known as Ward Lane and is about 200 yards from Diggle station and half a mile from Marsden tunnel, which is over three miles long.

Foreign Railway News

Mexico to Export Coal to Canada

For the first time in its history Mexico will become an exporter of coal on a large scale within the next few weeks. Authoritative announcement is made at Sabinas, Coahuila, that the Compania Carbonera Consolidada de Coahuila, subsidiary of the National Railways of Mexico, has contracted with large industrial interests in Canada for the sale of ten million tons of coal. Shipments will be at the rate of 200,000 tons a week. It is explained that this order is merely preliminary to the indefinite continuation of the contract provided the coal comes up to the tests which have already been made. For more than a year the Compania Carbonera Consolidada de Coahuila has been accumulating large reserve stocks of coal at its mines in the northern part of the state. Much speculation was indulged in as to the purpose of the big stores of fuel which the company was piling up. The price of the coal to the Canadian purchasers is not publicly known but it is said to be much below what coal could have been obtained for in the United States. The principal mines of the Compania Carbonera Consolidada de Coahuila are situated at Fuentea, within a few miles of Eagle Pass, Texas. These mines were originally developed by the late Collis P. Huntington who gave them a railroad outlet to the border by the construction of the Mexican International, subsidiary of the Southern Pacific. The mines passed into control of the Mexican government when it purchased the Mexican International and merged that line into the National Railways of Mexico.

The Railways of Hungary in 1922

The condition of rail transportation in Hungary showed little change during 1922, according to Consul E. C. Kemp, Budapest. Future prospects depend entirely upon the financial situation of the country and the stabilization of the crown, so that rates will bring in an increase permitting the maintenance of stock and way. The physical problems involved, although important, are subordinate to the financial and political problems of the State.

The length of permanent lines in Hungary at the end of 1922 totaled 4,535 miles, 1,905 of which are state owned. Experiments for the electrification of the lines were planned for the spring of 1923.

Owing to the high cost of labor and material and to the lack of investment funds, additions to track equipment during the year were of minor importance. The embankment on the Budapest-Kiskoros line was cindered, a bridge and a water tower were built, a cut was filled, tracks were relaid at one terminal, and construction was continued on the Budapeszi Works.

An attempt was made to improve conditions at the new frontier stations, as imposed by the peace treaty. On the Austrian frontier a temporary station was built at Hegyeshalom for passport and baggage control, and an office building and barracks were built at Mosonmagyaróvár, where the Hungarians and Austrians cooperate in the border control. A building was erected at Szob, on the Czecho-Slovak frontier, for passport, luggage, and freight clearance, with barracks for the personnel. A similar building was put up at Salgotarjan, while two barracks and three buildings are under construction. On the Rumanian frontier, platform scales were built at Lokoszlaza; another is being constructed at Nyirabrany, and two new sidings were built at Biharkeresztes. Nothing was done on the Yugoslav frontier. Very small housing investments were made at Miskolze, Pecs, and Bekeszaba.

An inventory of locomotives at the end of 1922 showed 1,326 first-class locomotives for express, passenger, and freight service on main lines, 669 second-class engines for passenger and freight service on local lines, and 7 third-class engines for narrow-gauge track, a total of 2,002 locomotives. Of this total, 173 have been discarded as worn out. New engines to the number of 89 were acquired during the year. The proportion of locomotives in need of repair was reduced from 35.6 per cent in 1921 to 28.1 per cent in 1922.

A total of 35,655 cars—2,255 passenger cars, 922 baggage cars, 31,429 freight cars, and 1,049 special freight cars (tank, refrigerator, and stock cars)—were owned by Hungarian railways

at the end of the year. The proportion of passenger cars in need of repair was reduced from 28 per cent in 1921 to 19 per cent in 1922; baggage cars, from 30 per cent to 25 per cent; and freight cars, from 14 per cent to 13 per cent.

No new locomotives were exported during the year, but 614 new cars manufactured by the Ganz-Danubius Co., the Schlick Nicholson Co., and the car factories of Gyor and Kistarcsa were shipped to Bulgaria, while 1,070 and 45 repaired cars were re-exported to Yugoslavia and Poland, respectively.

Statistics of income are not yet available, as the fiscal year did not close until June 30. Neither are final official statistics obtainable for the fiscal year 1921-22, but the estimated balance is shown in the following table compared with the last two years for which the balance is available:

TOTAL INCOME AND EXPENDITURES OF HUNGARIAN RAILWAYS FOR FISCAL YEARS 1919, 1921, 1923

Fiscal year ending June 30	Income Crown	Expenditures Crown	Deficit Crown
1919	732,577,000	939,281,000	206,704,000
1921	3,072,660,000	3,839,904,000	767,244,000
1922 (estimated)	5,635,100,000	10,545,600,000	4,910,500,000

Statistics for 1920 are not available because of the Bolshevik régime and the Rumanian occupation.

The deficit was due largely to the currency depreciation and to the fact that rates were not raised in ratio with increasing operating expenses.

The amount of goods and passenger traffic during 1922, in comparison with several preceding years, is shown in the following table:

TRAFFIC ON HUNGARIAN RAILWAYS DURING FISCAL YEARS 1918-1922

Fiscal year ending June 30	Train- kilometers	Passenger- kilometers	Ton-kilometers of freight
1918	88,243,000	8,594,927,927	6,797,122,526
1919	47,006,998	4,850,598,441	2,416,534,883
1920	12,345,350	1,667,954,978	626,137,809
1921	16,336,254	1,775,870,478	1,173,153,040
1922 (estimated)	24,222,575	2,126,681,286	1,636,291,189

The total amount of freight carried in 1921-22 was less than that carried in 1913 by 1,886,994 metric tons, or 11.9 per cent.

Hard and soft coal was the principal commodity carried by Hungarian railways in 1921-22. A total of 4,339,039 metric tons was transported, in comparison with 4,165,800 tons in 1913—an increase of a little over 4 per cent. Firewood was the next largest single item—1,986,314 metric tons, representing an increase of 1,630,141 tons (458 per cent) over the corresponding 1913 traffic, being carried during 1921-22. Other chief commodities in the order of their importance were clay, earth, and stone, grain and other agricultural products, lumber and timber, brick and tile, and foodstuffs.

Sir Percy Tempest, K. B. E.

The general manager of the South Eastern & Chatham section of the Southern Railway (England), Percy Crossland Tempest, has been appointed joint general manager of the Southern and, in addition, has been gazetted a Knight of the British Empire.

Sir Percy was born in 1860 and was educated at the City of Leeds Grammar School and Leeds University. He was then articled to the borough engineer of Leeds, and was subsequently engaged by the London & North Western on its Leeds extension. In 1881 he entered the service of the South Eastern and, in 1895, was appointed permanent way engineer. Upon the amalgamation of the South Eastern and London, Chatham & Dover in 1899 he became chief engineer to the managing committee.

During the war he was engaged on important work for the government. When the War Department decided to make a military base at Boulogne, he undertook the civil engineering work, which included the laying of two classification yards, the erection of hangars, the surfacing of the ground for storage areas, and intersecting the same with roadways, the laying of additional sidings on the quays and the construction of a Royal Engineers' park. In addition to other duties, Sir Percy Tempest has acted in an official capacity in connection with the inspection and purchase in this country of large quantities of permanent way and bridging material for the Northern Railway of France. For his services during the war Mr. Tempest, as he then was, was awarded the C. B. E., and also the Cross of Officer of the Order of Leopold of Belgium. He is a member of the Institution of Civil Engineers. On April 1, 1920, he was selected to succeed Sir Francis Dent as general manager of the South Eastern & Chatham, and in that capacity continued to perform also the duties of chief engineer of the undertaking.

Equipment and Supplies

Locomotives

CHOSEN-SANGYO RAILROAD.—See Mitsui & Co.

THE KANAWHA & HOCKING COAL & COKE COMPANY, Cleveland, Ohio, is inquiring for one Mikado type locomotive.

THE ATLANTIC REFINING COMPANY has ordered one 0-4-0 switching locomotive from the Baldwin Locomotive Works.

MITSUMI & COMPANY, 65 Broadway, New York City, are inquiring for four 2-6-2 type tank locomotives for the Chosen-Sangyo Railway, Japan. This firm is also inquiring for four other tank locomotives for export to Japan.

Freight Cars

THE ATCHINSON, TOPEKA & SANTA FE is inquiring for 200 flat cars.

THE ERIE is receiving prices for the conversion of 498 coke cars to box cars.

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 10 underframes for caboose cars.

MITSUMI & COMPANY, 65 Broadway, New York City, are inquiring for 80 dump cars, for export.

THE UNION RAILROAD will have 100 Clark dump cars built in the shops of the Greenville Steel Car Company.

THE PAN AMERICAN PETROLEUM COMPANY has ordered 10 tank cars of 10,000 gal. capacity, from the American Car & Foundry Company.

THE NEW YORK, NEW HAVEN & HARTFORD contemplates having about 2,000 freight cars repaired in the shops of the Keith Car & Manufacturing Company.

Passenger Cars

THE LEHIGH & NEW ENGLAND is inquiring for one private car.

THE LACKAWANNA & WYOMING VALLEY is inquiring for 10 cars for passenger service.

THE SOUTH AFRICAN RAILWAYS are inquiring for 50 narrow gage, third class coach and sleeping cars.

Iron and Steel

THE SEABOARD AIR LINE has received bids for 250 tons of steel for a bridge to be built over Lynch's river, South Carolina.

THE ST. LOUIS-SAN FRANCISCO has ordered 357 tons of structural steel for shops at Lindenwood, Mo., from the Spuck Iron & Foundry Company.

THE MISSOURI PACIFIC has ordered 375 tons of structural steel for one 208 ft. through riveted steel truss span from the Virginia Bridge & Iron Company.

THE ILLINOIS CENTRAL has ordered 1,100 tons of structural steel for grade separation work in the vicinity of Forty-first street, Chicago, from the American Bridge Company.

Machinery and Tools

THE ST. LOUIS-SAN FRANCISCO has placed an order for a 600-ton, 96-in. wheel press.

THE DENVER & RIO GRANDE WESTERN has placed an order for a 90-in. driving wheel lathe.

THE SOUTHERN PACIFIC has placed orders for a 200-ton locomotive lifting crane and a 215-ton crane for its Los Angeles shops.

THE NORFOLK & WESTERN, reported in the *Railway Age* of June 9 as inquiring for about 45 shop machine tools, has placed orders for a number of tools including a 73-in. boring mill, axle lathe, 42-in. boring mill and 600-lb. hammer.

Signaling

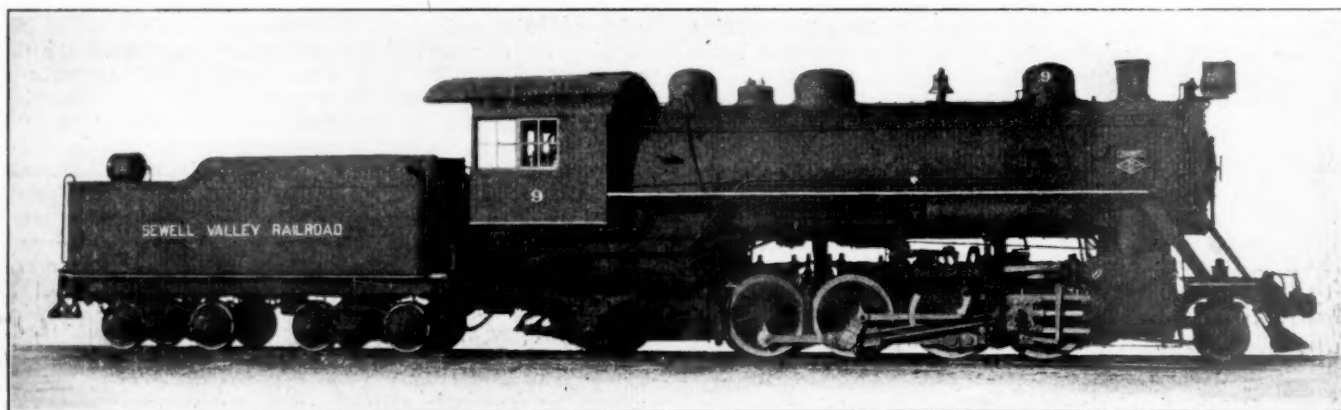
THE ATLANTIC COAST LINE has ordered from the General Railway Signal Company material for the installation of automatic train control, intermittent induction type, on its line, double track, between Falling Creek, Va., and Dunlop, 14 miles. This section is now equipped with automatic block signals and the train control apparatus is to be installed by the railroad company's forces.

Hall Searchlight Signals on the New York Central

The New York Central has ordered from the Hall Switch & Signal Co., Garwood, N. J., 267 Hall single unit "searchlight" color-light signals, together with other apparatus, and is to install the automatic block system on 109 miles of the West Shore railroad, Mohawk Division. The longest section extends from Rotterdam Junction, N. Y., westward to Harbor, near Utica, 70 miles. This work will require 155 signals, 900 relays, 200 switch controllers and other apparatus. The other section is from Amboy, N. Y., westward to Lyons, 39 miles, requiring 112 signals, 630 relays and other material.

The road has also ordered 11 of these signals and seven light signals of the marker type for installation at Dumont, N. J., on the West Shore, with other material; and seven searchlight and four marker type to be installed at Weehawken, N. J.

The "searchlight" signal is a color-light signal giving day and night indications with one light, through one white lens, the colors being produced by movable green, yellow and red glasses moved into and out of position by an electro-magnet.



Sewell Valley Locomotive Built by Lima Locomotive Works

Supply Trade News

The French Battery & Carbon Company has moved its Chicago office to 11 South Desplaines street.

The Belmont Smelting & Refining Works, Inc., 330 Belmont avenue, Brooklyn, N. Y., will in future operate the greater part of the metal business formerly conducted under the name of V. Henning & Sons.

R. P. Barnett, road foreman of engines of the Southern, and **Ernest Keathley**, general foreman of the Southern shops at Knoxville, Tenn., have been appointed service engineers of the **Franklin Railway Supply Company, Inc.**, New York City.

J. C. Bloomfield, who has been appointed district representative of the **Industrial Works** with headquarters in Chicago, was formerly inspection engineer of R. W. Hunt & Co., Chicago, instead of C. H. Hart & Co., as noted in the *Railway Age* of July 7.

Arthur Hale, formerly general agent of the American Railway Association at New York and Chicago and more recently engaged in private practice as an agent and attorney at Washington, D. C., has been elected chairman of the board of the **American Locker Company**, Boston, Mass.

The Brenner-Moxley-Mervis Company, Chicago, has been organized by local interests to engage in the production of copper rods and drawn copper wire for electrical power transmission. The company has bought eight acres of land on Kedzie avenue as a site for its plant, the first unit of which is now under construction. **N. T. Brenner** of the American Insulated Wire & Cable Company is president of the new company. **William J. Moxley** and **Geo. T. Moxley** are vice-presidents, **N. T. Brenner, Jr.**, is treasurer, and **Meyer B. Mervis** is secretary.

Eighteen hundred employees and executives of the **S. F. Bowser Company**, with many residents of Fort Wayne, Ind., gathered in Weisser park in that city to celebrate the production of its one millionth pump at Fort Wayne, Ind., on June 22. The ceremonies were presided over by F. C. Betchel, president, while S. F. Bowser, in the principal address of the afternoon traced the development of the company from the day when the first pump was made in a cow barn 38 years ago, up to the present. Following Mr. Bowser's address the millionth pump was unveiled, with the intention of placing it on the lawn of the Bowser plant as a mark of the company's progress.

The Air Reduction Company, Inc., New York City, has decided to call for payment on October 1, 1923, \$500,000 par value of its outstanding 7% debenture gold bonds due 1930. These bonds are callable at present at 105 and accrued interest. The serial numbers of the bonds to be drawn for payment on October 1 will be announced during the last week in July. In accordance with the terms of the trust agreement bonds so called may be converted into stock during the month of August, at the rate of sixteen shares of stock for each \$1,000 bond. Since the last quarterly statement of the company, issued April 19, 1923, \$254,000 out of a total then outstanding of \$1,906,000 of the company's bonds had been converted into stock, and the outstanding funded debt of the Davis-Bournonville Company, which amounted at that time to \$71,500, and which had been assumed by the Air Reduction Company, had been purchased and retired. The Company brought into production on July 15 its new plant, at Sharon, Pa., which will be of great value and advantage to the corporation in its service in that district.

Obituary

William Dailey, a railroad contractor and former superintendent of construction of the Canadian Pacific, died at his home near Montreal on July 9.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company will reconstruct its lumber mill at San Bernardino, Cal., which was damaged by fire on June 30 with a loss of \$400,000, including equipment and stock.

BALTIMORE & OHIO.—This company has awarded a contract to the Pittsburgh Construction Company covering the erection of superstructures at three bridges on the Valley Railroad of Virginia, between Strasburg Junction and Harrisonburg. The new structures consist of deck plate girder spans, varying in length from 50 to 75 ft., replacing old Bollman and Whipple truss bridges which have been in service for more than fifty years. About 680 tons of new steel work is involved.

CHICAGO, AURORA & ELGIN (Electric).—This company plans the construction of a three-story passenger terminal at Wells street, Chicago, to replace the present one-story building.

CHICAGO & NORTH WESTERN.—This company has awarded a contract to the Howlett Construction Company, Moline, Ill., for the erection of a 200-ton frame coaling station, with automatic electrical equipment, at Waseca, Minn.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded a contract to Morris & Dougherty, St. Paul, Minn., for the construction of a branch line to the Ford Motor Company's plant, St. Paul, as reported in the *Railway Age* of January 20.

ELGIN, JOLIET & EASTERN.—This company is calling for bids for the construction of a new one-story car repair shop at East Joliet, Ill., reported in the *Railway Age* of July 14.

ILLINOIS CENTRAL.—This company has awarded a contract to the Ellington Miller Company, Chicago, for alterations and extensions to the freight house at Decatur, Ill.

LONGVIEW, PORTLAND & NORTHERN.—This company has been authorized by the Interstate Commerce Commission to construct and operate a line in Cowlitz and Lewis counties, Washington. Permission to retain excess earnings was denied.

LOUISVILLE & NASHVILLE.—This company has awarded a contract to the Nichols Contracting Company, Atlanta, Ga., for grading and masonry construction for 16 miles of second track from Baileys, Ky., to Walls End, which was reported in the *Railway Age* of December 30, 1922. This company also contemplates the extension of the second track construction from Walls End to Harlan, a distance of approximately 39 miles. The cost of this project is estimated at \$3,500,000.

MICHIGAN CENTRAL.—This company has awarded a contract to the Ellington Miller Company, Chicago, for the construction of an 8-stall, reinforced concrete roundhouse, a boiler house, an office building and sanding facilities at Grand Rapids, Mich., to cost approximately \$100,000.

MICHIGAN CENTRAL.—This company has awarded a contract to the Dominion Construction Company, East Toronto, Ont., for the construction of five miles of new sidings and yard tracks at St. Thomas, Ont.

MOBILE & OHIO.—This company has awarded a contract to Keeley Brothers Contracting Company, East St. Louis, Ill., for the construction of a roundhouse and shop building at Jackson, Tenn., as reported in the *Railway Age* of May 26.

OREGON SHORT LINE.—This company is calling for bids for the construction of the new line from Orchard, Idaho, to Perkins, a distance of 22 miles, reported in the *Railway Age* of March 3.

PACIFIC ELECTRIC.—This company is constructing approximately six miles of new tracks in its freight yards at Los Angeles, Cal. The construction of new yard offices is included in the project, the total cost of which will be approximately \$198,000.

PENNSYLVANIA.—This company is asking for bids for all work necessary to complete an overhead highway bridge, 3,000 ft.

east of Larabee, Pa. The approximate quantities are as follows: 400 cu. yd. foundation excavation; 200 cu. yd. foundation masonry; and 400 cu. yd. neat abutment masonry. The work will be in charge of George Nauman, assistant to chief engineer, Pittsburgh, Pa.

PENNSYLVANIA.—This company has commenced the construction of a new two-story machine shop at Mt. Vernon, Ohio, to replace a building recently destroyed by fire.

PHILADELPHIA & READING.—This company has awarded a contract to Bennett & Randall, Lebanon, Pa., for the construction of concrete slabs to be used in the reconstruction of 12 bridges between Lurgan and Reading on the Philadelphia, Harrisburg & Pittsburgh and Lebanon Valley branches and between Reading and Allentown on the East Penn branch. These slabs will be pre-cast on casting platforms to be erected by the contractor at Lebanon and at Reading. Upon completion they will be erected by the Reading's forces. The railroad will furnish the necessary steel I-beams, rails for reinforcement, and the cement. Contracts for the waterproofing of these slabs have been awarded to Martin & Breen, Inc.

SOUTHERN PACIFIC.—This company has authorized the construction of a locomotive assembly shop at Los Angeles, Cal., to cost approximately \$500,000. This building will be the first unit of the projected additional shop facilities which were reported in the *Railway Age* of February 24. Construction of the new building will start in the fall.

TRINITY & BRAZOS VALLEY.—This company plans the construction of extensive freight terminal facilities at Galveston, Tex. The company owns eight blocks of land fronting on the harbor which will be used as a site for the tidewater terminal. Negotiations are now under way to secure trackage rights from Houston, Tex., to Galveston over the Galveston, Houston & Henderson.



Underwood & Underwood

Loading Locomotives at Eddystone, Pa., for Shipment to Chile

Railway Financial News

CANADIAN NATIONAL.—Equipment Notes.—The Canadian Minister of Finance is calling for tenders by July 25 for an issue of \$22,500,000 of Canadian National Railway 15-year equipment serial fives, Canadian payments, with Dominion of Canada guarantee, and repayable \$750,000 semi-annually.

This indicates the Minister of Finance intends to segregate railroad from other government financing, as far as possible. He was offered a good price for straight equipment fives in New York, but had to put the governmental guarantee on the Canadian offering, as the Canadian market has been unfamiliar with equipment trusts since the old Canadian Northern issues, twelve years ago. The trust is vested in the Minister of Finance. Another \$7,500,000 will be spent for Canadian National equipment in addition to the sum raised by the \$22,500,000 equipment trust issue, but this additional amount will be taken from the appropriation voted by Parliament. It is estimated there will be no further federal financing before October. On November 1, a war loan of \$172,000,000 matures. This will have to be met in part by a new loan, as not more than 50 per cent of the holders of the issue are expected to renew their loans.

CENTRAL OF NEW JERSEY.—Annual Report.—The annual report for the year ended December 31, 1922 shows a surplus of \$2,614 as compared with \$21,355,232 in 1921. A selection of the principal items in the income account follow:

	1922*	1921
Operating revenue	\$49,488,471	\$52,660,998
Operating expenses	42,197,422	43,621,696
Net operating revenue	7,291,049	9,039,301
Non-operating income	2,821,905	21,652,817
Total tax accruals	3,789,446	3,017,327
Rent for leased roads	2,328,581	2,329,646
Interest on funded debt	2,940,366	2,906,888
Surplus transferred to profit and loss	2,614	21,355,232

CHICAGO & NORTH WESTERN.—Authentication of Bonds.—This company has been authorized by the Interstate Commerce Commission to procure authentication and delivery to its treasurer of \$6,000,000 of first and refunding mortgage bonds to be held in the applicant's treasury until further order of the commission. Authority given to the applicant December 19, 1921, to authenticate and deliver \$3,000,000 of such bonds to the treasurer has been revoked.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—To Issue Bonds.—This company has been authorized by the Interstate Commerce Commission to issue \$883,000 of first and general mortgage gold bonds, series B.

CINCINNATI, INDIANAPOLIS & WESTERN.—Annual Report.—The annual report for the year ended December 31, 1922 shows a net deficit of \$128,823 as compared with a net deficit of \$111,654 in 1921. The condensed income account follows:

	1922	1921	Increase or Decrease
Railway operating revenue	\$4,363,693	\$3,716,572	\$647,121
Railway operating expenses	3,774,696	4,148,136	—373,440
Net operating revenues	588,998	Def. 431,564	1,020,561
Railway tax accruals	198,744	154,297	44,447
Net operating income	390,253	585,920	976,173
Total non-operating income	62,450	855,909	—793,459
Gross income	452,703	269,990	182,714
Deductions from gross income	379,985	217,737	162,248
Interest accrued on first mortgage bonds	146,271	133,750	12,521
Interest accrued on equipment trust obligations	24,667	30,156	—5,490
Interest accrued on bills payable	30,604	30,604
Net income deficit	128,823	111,654	17,169

Asks Authority to Issue Bonds.—The Cincinnati, Indianapolis & Western has applied to the Interstate Commerce Commission for authority to issue and pledge pending sale \$641,000 of first mortgage 5 per cent 50-year gold bonds. Of this amount \$600,000 would be issued to reimburse the applicant for capital expenditures from September 1, 1921, to June 2, 1923. The issue of the remaining \$41,000 already has been authorized. The bonds are dated November 1, 1915, and will mature November 1, 1965. The applicant desires to use the bonds as collateral for short term loans pending a satisfactory arrangement for sale at not less than 75 per cent of par.

DELAWARE & HUDSON.—Valuation Protest.—The suits brought by this company and eight of its subsidiary corporations, in the United States District Court at New York City last month, asking an injunction to forbid the Interstate Commerce Commission to fix tentative valuations on their property, came to trial on July 16, and the injunction was denied. Officers of the company say

that the case will be appealed to the Supreme Court of the United States. They aver that the valuation of \$95,680,800 calculated by the Commission is far below a fair figure. They call attention to the provision in the Valuation Act, Section 19-A, that the Interstate Commerce Commission should find the original cost to date; the cost to reproduce the railroad, and the cost of reproduction less depreciation; and should present an analysis of the methods by which the costs were determined, and the reasons for the differences in the different costs. This, they say, the commission failed to carry out. As required by the Act, the company has filed its objection with the Interstate Commerce Commission.

DENVER & RIO GRANDE WESTERN.—Annual Report.—The annual report for the year ended December 31, 1922, issued this week, shows a net deficit of \$368,467 as compared with a net deficit of \$3,773,655 in 1921. A selection of the principal items in the income account follows:

	1922	1921	Increase or Decrease
Operating Revenues:			
Freight	\$25,036,212	\$24,216,606	\$819,606
Passenger	5,585,624	6,022,383	-436,759
Total operating revenues....	33,350,593	32,621,419	729,174
Operating Expenses:			
Maintenance of way and structures	4,997,381	6,422,430	-1,425,049
Maintenance of equipment....	7,570,119	7,894,511	-324,392
Traffic	543,647	514,892	27,756
Transportation	11,615,142	11,285,464	329,678
Miscellaneous operations.....	618,623	610,663	7,960
General	998,407	1,029,724	-31,317
Total operating expenses....	26,304,805	27,746,090	-1,441,286
Net revenue from operation..	7,045,789	4,875,329	2,170,460
Tax accruals	1,830,015	1,844,146	-14,131
Total operating income.....	5,208,068	3,026,604	2,181,464
Gross income	7,514,094	5,622,977	1,891,117
Total deductions	7,882,560	9,396,632	-1,514,072
Net income.....	Def. 368,467	Def. 3,773,655	3,405,189
Income applied to sinking fund..	260,962	296,708	-35,746
Income applied to renewal fund..		3,100	-3,100
Income balance	Def. 629,429	Def. 4,073,464	3,444,035

ELGIN, JULIET & EASTERN.—Annual Report.—The income account for the year ended December 31, 1922 compares as follows:

	1922	1921	Increase or Decrease
Operating revenues	\$21,483,415	\$19,334,942	\$2,148,473
Operating expenses	13,697,891	13,613,040	84,851
Net from railway operations....	7,785,524	5,721,902	2,063,622
Railway tax accruals.....	1,154,697	933,167	221,531
Railway operating income.....	6,630,827	4,788,736	1,842,091
Net railway operating income....	5,152,091	3,370,349	1,781,742
Gross income	5,474,813	4,840,646	634,166
Total deductions.....	3,808,961	3,579,869	229,092
Net income	1,665,851	1,260,777	405,074

FLORIDA EAST COAST.—Equipment Trust Issue.—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability for \$2,000,000 of equipment trust certificates, series C, to be sold at not less than 96.3 and the proceeds applied to the purchase of equipment.

GEORGIA, FLORIDA & ALABAMA.—Exchange of Securities.—This company has been authorized to issue \$2,235,000 of common capital stock in lieu of its present outstanding stocks and bonds by the Interstate Commerce Commission.

MINARETS & WESTERN.—New California Line.—This company has applied to the Interstate Commerce Commission for authority to operate and to retain excess earnings of a line now under construction between Friant, Fresno County, on the Southern Pacific, to the Crane Valley Dam, Madera county, Calif., a distance of about 40 miles, and also from Pinedale Junction, Fresno county, to the townsite of Pinedale, about 5 miles. The line will be used largely in logging operations. It will connect the timber lands in Madera county with a lumber mill under construction at Pinedale and also will serve as a route for the transportation of lumber from the mill to Pinedale Junction on the Southern Pacific.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Common Stock Dividend.—The Continental Insurance Company and the Fidelity-Phenix Fire Insurance Company, owners of \$130,000 of Soo preferred stock, have asked the United States Supreme Court to review the decisions of the federal court at Minneapolis and the Circuit Court of Appeals at St. Louis, Mo., that the Minneapolis, St. Paul & Sault Ste. Marie could pay dividends on its common stock before paying full 7 per cent on the preferred.

Annual Report.—This company's annual report for 1922 is reviewed in an article on another page of this issue entitled "Soo's Five Months Earnings Promise Well for 1923." See also excerpts from annual report on adjacent page.

NEW YORK, CHICAGO & ST. LOUIS.—Equipment Certificate Issue Approved.—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability for \$4,275,000 of equipment trust certificates to be sold at the best price obtainable but not in excess of a cost to yield 6 per cent to the applicant.

NEW YORK, NEW HAVEN & HARTFORD.—Master Appointed.—Elbridge R. Anderson has been appointed today by Judge Carroll of the Massachusetts Supreme Court as master to hold hearings in connection with the bill in equity brought by Edmond D. Codman to prevent the New York, New Haven & Hartford from exercising control of about 28.3 per cent of Boston & Maine stock, which trustees of the Boston Railroad Holding Company have been ordered to turn back to the New Haven.

To Abandon Branch.—The New Haven has been given permission by the Interstate Commerce Commission to abandon a branch line in Franklin county, Mass.

NORFOLK & WESTERN.—Convertible 10-25 Year 4½ Per Cent Bonds of 1938.—The attention of holders of these bonds is called to the fact that under the terms of the trust agreement covering the issue, the privilege of converting the bonds into paid-up shares of common capital stock may be exercised only before September 1, 1923. On and after that date the holders of such bonds will not be entitled to exchange them for common stock.

READING COMPANY.—Equipment Trust Issue Approved.—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability for \$6,000,000 equipment trust certificates, series 1, to be sold at not less than par in connection with procurement of equipment.

SPRINGFIELD TERMINAL.—Capital Stock Issue.—This company has been authorized by the Interstate Commerce Commission to issue \$15,800 of capital stock to be sold at not less than par.

TEXAS, PANHANDLE & GULF.—Incorporation.—Articles of incorporation of the Texas, Panhandle & Gulf, a new company with capital stock of \$2,700,000, have been approved by the attorney general of Texas and will soon be filed with the secretary of state. The company proposes the construction of a new line from Fort Worth, Tex., to a point on the New Mexico state line, a distance of 380 miles. Headquarters of the road are to be at Tulia, Tex. The incorporators of the new company are C. H. Powell and L. F. Powell of Tulia, Tex., and E. J. Noonan and others of Chicago. Directors of the company are C. H. Powell, L. L. Cooper, Foster Klaus, E. J. Noonan, J. L. Smith and C. R. Young.

UNADILLA VALLEY RAILWAY.—Note Issue Approved.—This company has been authorized to issue several promissory notes, unsecured, aggregating \$350,000.

UNION TERMINAL COMPANY OF DALLAS.—Note Extension.—This company has been authorized by the Interstate Commerce Commission to enter into an agreement with holders of \$510,000 of its 5 per cent unsecured notes for an extension of the maturity date from October 10, 1923 for one year.

WACO, BEAUMONT, TRINITY & SABINE RAILWAY.—Acquires Property.—This company has been authorized by the Interstate Commerce Commission to acquire and operate a 66-mile line formerly operated by the Trinity & Sabine, extending from Trinity, Tex., to Colmesneil.

Dividends Declared

Cuba Railroad.—Preferred dividends (two), 3 per cent, semi-annually, payable August 1 and February 1, 1924 to holders of record July 23 and January 19, respectively.
Nashville, Chattanooga & St. Louis.—3½ per cent, semi-annually, payable August 1 to holders of record July 21.
Fullman Company.—\$2.00, quarterly, payable August 15 to holders of record July 31.

Trend of Railway Stock and Bond Prices

	July 17	Last Week	Last Year
Average price of 20 representative railway stocks	61.32	60.68	67.65
Average price of 20 representative railway bonds	82.41	82.31	87.78

Annual Report

Minneapolis, St. Paul & Sault Ste. Marie Railway Co., Including Chicago Division (Wisconsin Central Ry.)

FOR THE FISCAL YEAR ENDED DECEMBER 31, 1922

To the Stockholders:

Submitted herewith is a report for the fiscal year ended December 31, 1922. The Gross Earnings, Operating Expenses, Fixed Charges, Surplus, etc., are as shown in the following condensed statement:

	Soo Line	Chicago Div.	System
Gross Earnings	\$28,266,940.05	\$18,840,165.37	\$47,107,105.42
Operating Expenses	21,777,899.99	14,664,950.97	36,442,850.96
Net Earnings	\$6,489,040.06	\$4,175,214.40	\$10,664,254.46
Income from Other Sources....	1,549,706.94	172,216.75	1,721,923.69
Total Income	\$8,038,747.00	\$4,347,431.15	\$12,386,178.15
Fixed Charges, Taxes, etc....	7,539,700.70	3,851,061.37	11,390,762.07
Addition to Surplus.....	\$499,046.30	\$496,369.78	\$995,416.08

The Freight Revenue for the system during 1922 was \$35,529,521, an increase of \$4,439,146, or 14 per cent, as compared with the previous year, while the number of tons of revenue freight carried one mile showed an increase of 28 per cent. Rate reductions ordered by the Interstate Commerce Commission, effective in 1922, caused an estimated reduction in revenue of \$3,141,000. Notwithstanding the increase in the number of tons of revenue freight carried one mile, Transportation Expenses increased only \$68,826.82, or three-tenths of one per cent.

The grain crop harvested in 1922 was the largest since the crop of 1915. Had this company been able to keep a larger percentage of its equipment on its own lines, its revenue would have been considerably increased. Owing to this condition, the movement of grain during the early part of 1923 should be above normal.

Maintenance of Equipment Expenses decreased \$2,593,827 as compared with the abnormal maintenance expenses of the previous year. A portion of this decrease was due to the interruption of our maintenance program during July, August and September by a general strike of the Shop Crafts. Normal forces, consisting largely of former employees, were restored early in October. At the present time, the percentage of equipment out of service requiring repairs is lower than in the early months of 1922.

The strike resulted in a new organization being formed by the employees of the Mechanical Department and a new agreement has been made with them which is free from many restrictions and unfavorable working conditions previously in effect.

Maintenance of Way Expenses decreased \$735,669. This decrease was principally due to the decrease in price of ties and other track material, together with a slight decrease through reductions in pay of employees in this department under decisions of the United States Labor Board during the latter part of the year.

The outstanding indebtedness was increased during the year, as follows:

Minneapolis, St. Paul & Sault Ste. Marie Railway Co.:	
First Refunding Mortgage, Series "A"	\$2,500,000.00
Two-Year 5½% Gold Notes, due June 28, 1924	3,000,000.00
Leased Line Certificates	9,000.00

Total Increase

The outstanding indebtedness was decreased during the year, as follows:

Minneapolis, St. Paul & Sault Ste. Marie Railway Co.:	
Equipment Trust Obligations	\$747,235.77
One-Year 7% Gold Notes	3,000,000.00

Wisconsin Central Railway Company:

Marshfield and Southeastern Division, P. M.	
Bonds	6,000.00
Equipment Trust Obligations	199,764.23

Total Decrease

Net Increase during the year.....

During the year, there has been expended for Additions and Betterments to Road a net amount of \$1,085,375.96. There was also expended for Additions and Betterments to Equipment a net amount of \$1,284,693.69.

On March 10, 1922, the Board of Directors declared dividends of \$2.00 per share on both Preferred and Common Stock payable on April 15, 1922, out of accumulated surplus earnings of the calendar years 1909 to 1919, inclusive, there being no surplus earnings in the year 1921. The dividends declared were made equal on the two classes of stock because the Company's Articles of Consolidation provide that after Preferred and Common Stock have received 7 per cent each from the earnings of any year, as they had received from the earnings of 1909 to 1919, all further dividends from the earnings of any such year shall be equal on the two classes of stock, share for share.

On April 12, 1922, two of the Company's Preferred Stockholders brought suit in the United States District Court for Minnesota, claiming that the Preferred Stock was entitled to receive the first 7 per cent in dividends declared in any year, regardless of the source from which they were to be paid. The court enjoined the Company from paying the dividends pending the decision of the suit. On June 26, 1922, the District Court decided the suit in favor of the Company, sustaining the action of the Board of Directors. The plaintiffs then took an appeal to the United States Circuit Court of Appeals at St. Louis, the injunction against payment of the dividends remaining in effect.

On December 4, 1922, the Board of Directors declared further dividends of \$2.00 per share on Preferred and Common Stock payable on December 28, 1922, out of accumulated surplus earnings of the years 1909 to 1919, inclusive. Another suit was then begun by the previously mentioned plaintiffs claiming the same rights as in their former suit. Identical questions being involved in the two suits, the Court enjoined payment of the December dividends pending the decision of the suit in which the appeal had been taken.

On February 1st, 1923, the appeal was argued before the United States Circuit Court of Appeals at St. Louis; and the decision of that Court is now awaited.

The cost to your company of this valuation work as of December 31, 1922, aggregates \$406,686.46.

Deep regret is felt in recording the death, on September 17, 1922, of Mr. Richard B. Angus, of Montreal, Canada, who was a director of the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, from June 2, 1896, to the time of his death.

Various statements covering the operations of the property during the period January 1 to December 31, 1922, will be found on the following pages. Respectfully submitted,

G. R. HUNTINGTON,
President.

GENERAL BALANCE SHEET DECEMBER 31, 1922

ASSETS	
Property Investment:	
Road	\$105,945,988.98
Equipment	28,698,524.70
	\$134,644,513.68
Less Reserve for Equipment Depreciation....	6,912,356.00
Total	\$127,732,157.68
Sinking Funds	25,000.00
Deposits in Lieu of Mortgaged Property.....	12,577.58
Miscellaneous Physical Property.....	730,763.29
Investments in Proprietary, Affiliated and Controlled Companies:	
(Per Schedule of Securities Owned on Page 18)	
Stocks	\$19,832,337.09
Bonds	3,000.00
W. C. Ry. Co. Equipment Contracts.....	1,450,114.30
Advances	1,536,262.04
Total	22,821,713.43
Other Investments:	
Stocks	\$451.00
Bonds	60,950.00
Notes	275,000.00
Total	336,401.00
Current Assets:	
Cash	\$4,143,519.72
Time Drafts and Deposits.....	1,512,408.00
Special Deposits	2,089,708.84
Loans and Bills Receivable.....	76,853.52
Traffic and Car Service Balances.....	124,765.75
Agents and Conductors' Balances.....	1,765,496.64
Miscellaneous Accounts Receivable.....	1,214,044.95
Wisconsin Central Railway Company.....	2,590,484.13
Material and Supplies.....	4,647,484.54
Interest and Dividends Receivable.....	41,077.51
Rents Receivable	1,364.45
Other Current Assets.....	273,113.20
Total	17,980,321.35
Deferred Assets:	
Working Fund Advances.....	\$64,985.85
Other Deferred Assets.....	51,598.80
Total	116,584.65
Unadjusted Debits:	
Rents and Insurance Paid in Advance....	\$30,261.39
Discount on Funded Debt.....	737,865.23
Other Unadjusted Debits.....	1,348,721.09
Total	2,116,847.71
Grand Total	\$171,872,366.69
LIABILITIES	
Capital Stock:	
Common	\$25,206,800.00
Preferred	12,603,400.00
Total	\$37,810,200.00
Government Grants:	
Grants in Aid of Construction.....	6,031.75
Funded Debt Unmatured.....	92,834,000.00
(Per Funded Debt Schedule on Page 19)	
M. St. P. & S. S. M. Ry. Co. Leased Line Certificates	11,230,400.00
(Issued in exchange for Preferred Stock of Wis. Central Ry. Co., held by Trustee.)	
Current Liabilities:	
Loans and Bills Payable.....	\$2,953,000.00
Traffic and Car Service Balances.....	828,892.13
Audited Vouchers and Wages Payable....	3,124,527.75
Miscellaneous Accounts Payable.....	218,610.63
Interest Matured Unpaid.....	1,641,490.70
Dividends Matured Unpaid.....	1,522,581.00
Unmatured Interest Accrued.....	405,584.58
Unmatured Rents Accrued.....	82,619.76
Other Current Liabilities.....	532,327.93
Total	11,309,634.48
Deferred Liabilities	13,061.04
Unadjusted Credits:	
Tax Liability	\$1,661,549.71
Premium on Funded Debt.....	11,974.02
Insurance and Casualty Reserves.....	119,239.49
Operating Reserves	151,643.74
Other Unadjusted Credits.....	637,518.02
Total	2,581,924.98
Corporate Surplus:	
Additions to Property through Income and Surplus	\$128,590.10
Profit and Loss—Credit Balance.....	15,958,524.34
Total Corporate Surplus.....	16,087,114.44
Grand Total	\$171,872,366.69

[ADVERTISEMENT]

Railway Officers

Executive

E. F. Flynn has been appointed assistant to the vice-president and general counsel of the Great Northern, with headquarters at St. Paul, Minn. He will have charge of the public relations bureau.

Financial, Legal and Accounting

George P. Orlady has been appointed general solicitor of the Lehigh & New England with headquarters at Philadelphia.

Operating

C. F. Walcott has been appointed district manager of the Car Service division of the American Railway Association, with headquarters at Pittsburgh, Pa.

H. J. Mullaghy has been appointed superintendent of the Delaware, Lackawanna & Western with headquarters at Scranton, Pa. Mr. Mullaghy was born at Nanticoke, Pa., on December 18, 1870, and attended public school from 1876-1881. He then took up coal mining and worked in breakers and mines in both the anthracite and bituminous fields for the next ten years when he secured a position as a trainman on the Delaware, Lackawanna & Western at Kingston, Pa. In 1894 he was promoted to yard conductor and in 1898 to road conductor. In 1901 he became yardmaster at Gouldsboro, Pa., and, in 1903, was transferred in a similar capacity to Kingston. The following year he was promoted to general yardmaster at Binghamton, N. Y., and in 1908 was transferred in a similar capacity to Scranton, Pa. In 1910 he was promoted to assistant trainmaster with the same headquarters and in 1913 was appointed trainmaster at Binghamton. From October, 1918, to March, 1919, he was engaged on special work for the Railroad Administration at the New York terminals. From March, 1919, to October of the same year he was terminal trainmaster of the Lackawanna at Scranton, when his title was changed to that of senior trainmaster with the same headquarters. Mr. Mullaghy's railroad career, almost 32 years, has been entirely with the Lackawanna, with the exception of the brief period in which he was in the service of the Railroad Administration.



H. J. Mullaghy

promoted to general yardmaster at Binghamton, N. Y., and in 1908 was transferred in a similar capacity to Scranton, Pa. In 1910 he was promoted to assistant trainmaster with the same headquarters and in 1913 was appointed trainmaster at Binghamton. From October, 1918, to March, 1919, he was engaged on special work for the Railroad Administration at the New York terminals. From March, 1919, to October of the same year he was terminal trainmaster of the Lackawanna at Scranton, when his title was changed to that of senior trainmaster with the same headquarters. Mr. Mullaghy's railroad career, almost 32 years, has been entirely with the Lackawanna, with the exception of the brief period in which he was in the service of the Railroad Administration.

C. H. Baltzell, superintendent of the Central division of the St. Louis-San Francisco, with headquarters at Fort Smith, Ark., has been transferred to the Southwestern division, with headquarters at Sapulpa, Okla., succeeding L. N. Bassett, who has resigned. **S. T. Cantrell** has been appointed superintendent of the Central division, with headquarters at Fort Smith, Ark., succeeding Mr. Baltzell.

G. E. Donnatin, assistant trainmaster of the Los Angeles division of the Southern Pacific, with headquarters at Indio, Cal., has been promoted to trainmaster, with the same headquarters, succeeding W. H. Jones, who has been assigned to other duties. **L. L. Laughlin** has been appointed assistant trainmaster of the Los Angeles division, with headquarters at Indio, Cal., succeeding Mr. Donnatin.

Traffic

L. C. Reese has been appointed general agent for the Wheeling & Lake Erie, with headquarters at St. Louis, Mo.

D. M. Johnson has been appointed agricultural agent of the Canadian National, reporting to E. A. Field, land commissioner, Winnipeg.

S. B. Markes, city freight agent for the Gulf, Colorado & Santa Fe at Galveston, Tex., has been promoted to division freight agent, with the same headquarters.

M. S. Kitchen, traveling passenger agent of the Missouri Pacific with headquarters at Little Rock, Ark., has been promoted to general agent with the same headquarters.

C. L. McFaul, general agent, traffic department of the Southern Pacific, with headquarters at Chicago, has been promoted to general passenger agent of the lines west of El Paso, Tex., and Ogden, Utah, with headquarters at San Francisco, Cal.

S. W. Fisher has been appointed general agent for the National Railways of Mexico, with headquarters at Chicago, succeeding **E. Cerdan**, whose promotion to assistant general freight agent, with headquarters at Mexico City, Mexico, was reported in the *Railway Age* of July 14.

C. B. Sloat, assistant general passenger agent of the Chicago, Rock Island & Pacific, with headquarters at Little Rock, Ark., will retire from active service on August 1. **H. H. Hunt**, division passenger agent, with headquarters at Oklahoma City, Okla., will succeed Mr. Sloat as assistant general passenger agent, with headquarters at Little Rock.

B. E. Smeed, general agent, passenger department of the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at St. Paul, Minn., has been promoted to assistant general passenger agent with headquarters at Chicago, succeeding **F. B. Martin**, retired. **W. H. Lennon** has been appointed general agent, passenger department, with headquarters at St. Paul, succeeding Mr. Smeed.

H. M. Spence, assistant general baggage agent of the Canadian National, Western Region, with headquarters at Winnipeg, Man., has been promoted to general baggage agent with the same headquarters. **Albert Davidson**, division freight agent, steamship traffic, with headquarters at Vancouver, B. C., has been promoted to assistant general freight agent, steamship traffic, Western Region, with the same headquarters. **C. G. Ortenburger**, general agent, passenger department, with headquarters at Chicago, has been promoted to general western passenger agent, with the same headquarters. **H. L. McCaughy**, city passenger agent with headquarters at Chicago, has been promoted to general agent, passenger department with the same headquarters, succeeding Mr. Ortenburger, promoted.

W. M. Orr, general freight agent of the Chicago region of the Erie, with headquarters at Chicago, has been promoted to general freight and passenger agent, with headquarters at New York, succeeding **H. C. Snyder**, who has been transferred. **J. G. Hill**, general agent, with headquarters at St. Louis, Mo., has been promoted to general freight agent of the Chicago region, with headquarters at Chicago, succeeding Mr. Orr. **L. H. Mann**, general agent, with headquarters at Indianapolis, Ind., has been transferred to St. Louis, Mo., succeeding Mr. Hill. **O. R. Davies** has been appointed general agent, with headquarters at Indianapolis, Ind., succeeding Mr. Mann. **T. J. Martin** has been appointed commercial agent at Columbus, Ohio; **C. C. Nelson** has been appointed commercial agent at Milwaukee, Wis., and **C. Patton** has been appointed commercial agent at Birmingham, Ala.

Mechanical

A. J. Flowers, master mechanic on the Central of Georgia, with headquarters at Columbus, Ga., has been transferred to Macon, Ga., succeeding **C. L. Dickert**, whose promotion to superintendent motive power, with headquarters at Savannah, Ga., was reported in the *Railway Age* of July 14. **W. A. McCafferty**, assistant master mechanic, with headquarters at Macon, has been promoted to master mechanic, with head-

quarters at Columbus, Ga., succeeding Mr. Flowers. **E. L. Cox** has been appointed assistant master mechanic, with headquarters at Macon, succeeding Mr. McCafferty.

E. G. Chenoweth, mechanical engineer of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been promoted to superintendent of the car department, with the same headquarters, succeeding **J. H. Milton**, who has been appointed general foreman, car department, of the Terminal division, with headquarters at Chicago. Mr. Chenoweth was born on December 18, 1875, at Union City, Ind., and attended Purdue University from 1895 to 1898. He entered railway service in 1895 as a special apprentice on the Erie at Huntington, Ind., and until 1901 was employed consecutively as machinist, air brake instructor and foreman of the air brake department. He was appointed draftsman on the Pennsylvania at Altoona, Pa., in 1901, later serving in the same capacity on the Pere Marquette, the Lake Shore & Michigan Southern and the Philadelphia & Reading. Mr. Chenoweth was appointed mechanical engineer of the Erie, with headquarters at Meadville, Pa., in 1906. In July, 1913, he was appointed assistant superintendent of the car department of the Chicago, Rock Island & Pacific, with headquarters at Chicago, being promoted a year later to mechanical engineer in charge of car design. He was appointed mechanical engineer in charge of locomotive and car design in November, 1918, which position he held at the time of his recent promotion to superintendent of the car department.



E. G. Chenoweth

Engineering, Maintenance of Way and Signaling

J. A. Lenecek, until recently engaged as engineer in the engineering and construction department of the Erie with headquarters at New York, has been appointed chief engineer of the Quito-Esmeraldas Railway in Ecuador, S. A., the road being the rail connection of the country's capital, Quito, with the seaport of Esmeraldas. After his graduation as a civil engineer from the Engineering University of Prague (Bohemia) in 1912 he was employed on railroad location and on construction of a dam-reservoir project in Czechoslovakia. In 1913 he accepted a position as construction engineer of the Machacamarca-Uncia Railway in Bolivia, S. A., a railway serving the largest tin mines in the world. In 1915 Mr. Lenecek joined the consulting engineering firm of P. M. Klein, New York City, where he was engineer in charge of all civil engineering work, and in 1916 he entered the New York office of the Erie, where he has been in responsible charge of designing and estimating for the last seven years.



J. A. Lenecek

R. D. Brown, roadmaster on the Atchison, Topeka & Santa Fe, with headquarters at Kingman, Ariz., has not been ap-

pointed engineer in charge of construction of the National Railways of Mexico line from Mexicali to the Gulf of California, as was reported in the *Railway Age* of June 30. The new engineer of construction of the Mexican lines is another man with the same name.

Purchasing and Stores

A. F. Schmuhl has been appointed general lumber agent of the Pullman Company with headquarters at Chicago, succeeding A. F. Jones, assigned to other duties.

Obituary

J. G. LeGrand, bridge engineer of the Western region of the Canadian National, with headquarters at Winnipeg, Man., died in that city on July 2.

L. W. Hendricks, mechanical superintendent of the Bangor & Aroostook with headquarters at Derby, Me., was killed in an automobile accident near St. Agatha, Me., on July 12.

F. M. Clark, formerly superintendent of the New York, New Haven & Hartford at New York, died at Danbury, Conn., on July 15. Mr. Clark retired from active duty last October when he was stricken with apoplexy, which eventually led to his death.

O. G. Cox, assistant superintendent of the Eastern division of the St. Louis-San Francisco with headquarters at Springfield, Mo., died on July 3 following a brief illness. Mr. Cox was born at Georgia, Ind., on June 21, 1887. He entered the service of the Frisco as a telegrapher at Olathe, Kans., on June 12, 1907, and served as telegrapher, dispatcher and chief dispatcher until February 1, 1917, when he was promoted to assistant superintendent of the Southwestern division with headquarters at Sapulpa, Okla. He was transferred to the same position on the Eastern division on August 15, 1917, where he remained until his death.

William Moir, retired mechanical superintendent of the Northern Pacific, whose death on June 26 at Tacoma, Wash., was reported in the *Railway Age* of July 7, page 54, was born on July 7, 1851, at Dundee, Scotland. Previous to his employment with the Northern Pacific, Mr. Moir was associated with the Brooks Locomotive Works at Paterson, N. J., and with the Missouri, Kansas & Texas at Parsons, Kan. In 1881 he was appointed general foreman of the Northern Pacific at Sprague, Wash., and shortly after was promoted to master mechanic. He was then transferred to Spokane, Wash., in the same capacity and in 1903 was promoted to shop superintendent and after a short period was again promoted to general master mechanic of the Western district with headquarters at Tacoma. In 1906 Mr. Moir was appointed mechanical superintendent with headquarters at St. Paul, Minn., in which capacity he served for several years and on May 1, 1911, he retired from active service.

Herbert M. Matthews, coal traffic manager of the Baltimore & Ohio for the past eight years, died on July 10 of pneumonia at his country residence on the Bush river, near Aberdeen, Md. Mr. Matthews was born October 11, 1860, at South Bend, Ind. After being educated in the public and high schools of that city, he entered railway service November 21, 1881, as clerk in the general freight office of the Chicago, Burlington & Quincy at Chicago, being promoted to general agent of that company at Pittsburgh, October 15, 1886, where in April, 1897, he first became identified with the Baltimore & Ohio as commercial freight agent. Six months later, Mr. Matthews was advanced to division freight agent and on February 1, 1904, in addition to being division freight agent, was made coal and coke agent at Pittsburgh. Mr. Matthews went to Baltimore in July, 1905, as general coal and coke agent and in July, 1915, became coal traffic manager of the system. During Federal control he was a member of the committee in charge of coal and coke traffic in Trunk Line and New England territory and when the committees were reorganized after the return of the roads to private management, Mr. Matthews was for a year chairman of the Coal and Coke Committee, Trunk Line territory, and a member of that committee until his death.